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General Article

THE PHYSIOLOGY OF MILK AND BUTTER FAT SECRETION

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I.—Milk Pressure in the Udder

INTRODUCTION

In any consideration of the physiology of milk and butter fat production the causes and effects of milk pressure within the udder are of fundamental importance. Incidental references to these occur throughout the literature and it is the purpose of this paper to bring these together and to offer theories which will explain a series of facts. The complete proof of these theories must necessarily await further experimental tests, but they are put forward provisionally to form a basis for attacking this aspect of the physiology of milk secretion.

ANATOMICAL CONSIDERATIONS

The whole structure of the cow's udder appears to be designed for the relief of pressure on the secretory alveolar cells. The elastic fibrous tissue coat (Bitting[5]), the elastic fibres round the ducts (Christ,[8] Wirz,[57] Sticker[49]) and the thin elastic skin, producing an udder which "shrinks away to nothing" after the milk is withdrawn, or which will expand easily as milk is secreted into it—the ideal udder of the cattle judge—is a mechanism for keeping the internal milk pressure in the udder as low as possible compatible with the accommodation of a large volume of milk. The provision of a large milk cistern to each quarter, too, acts to relieve pressure on the actual secreting cells in the same way as the bladder acts for urinary secretion. Moreover, should all these mechanisms fail to keep the milk pressure in the alveoli below that which is harmful to the mammary cells, the sphincter mechanism (Riederer,[44] Mankowski,[34] Käppeli[27]) of the teat (the rosette of Fürstenberg[16]) provides a safety valve by which the pressure can be reduced by the leaking of milk from the udder, as is seen in the case of cows which have been "stocked up" for sale. Even the structure of the ducts (Rubelli,[46] Ziegler,[59] Wirz[57]), narrowing as they do before entering a larger duct, suggests something of a valve mechanism for preventing the back flow of milk from the larger ducts to the smaller ducts and alveoli when pressure is put upon the udder as a whole (*see* erection of the udder below).

THE "LETTING DOWN" OF MILK

A study of the changes in the milk pressure in the udder, made by manometer readings from the nipple (Zwart,[64] Tgetgel[54]) shows that the pressure rises gradually from one milking to the next as milk accumulates in the cistern. At the beginning of milking, however, there is a sudden and very large increase of pressure, and then as milking proceeds the pressure gradually falls (*see* Fig. 1 from Tgetgel[54]—over-leaf).

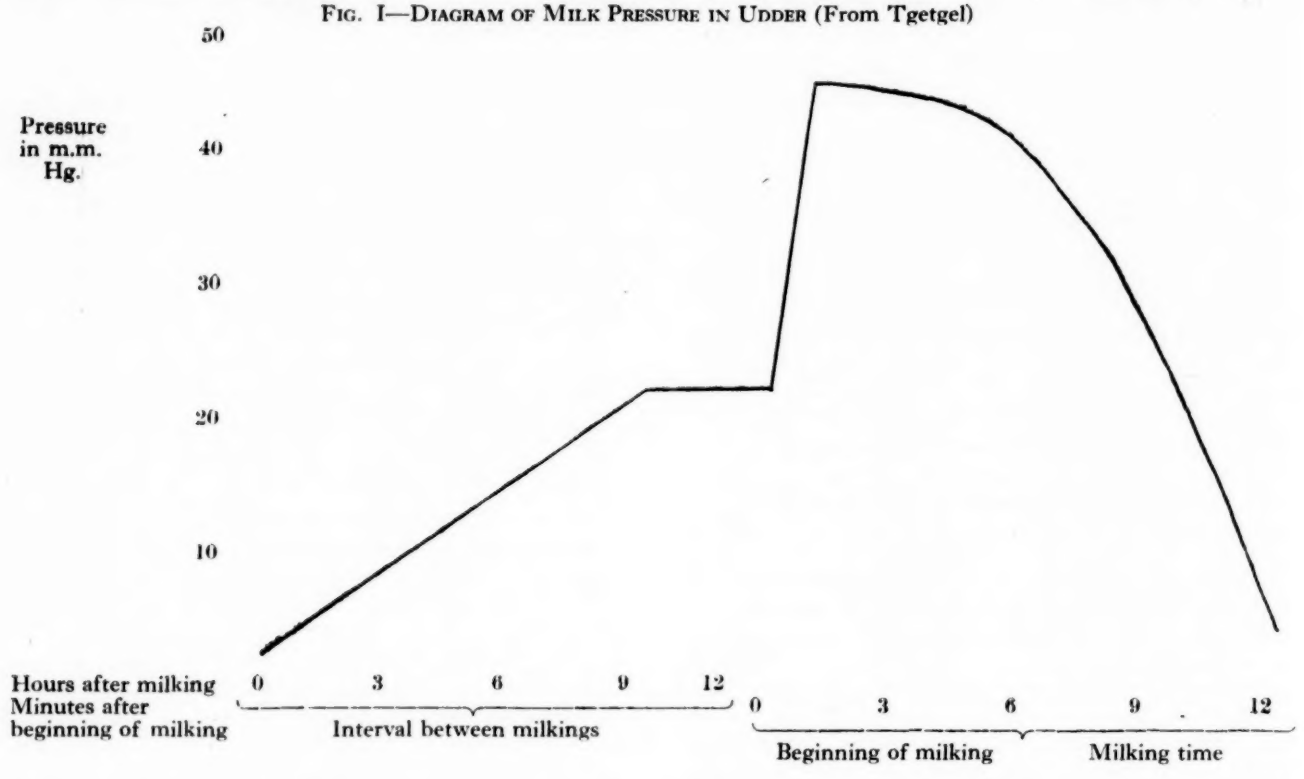
This sudden increase of milk pressure at the beginning of milking might be, and indeed has been, explained by some (Zschokke,[63] Nüesch,[38] Zietzschmann,[61] Crowther[10]) as an increased secretion of milk due to a nervous reflex set up by the stimulation of drawing the nipples. In support of this the fact is quoted that frequently in women when the child is put to one breast milk flows from the other. Those who hold this theory maintain that only about a half of the milk is actually secreted during the interval between milkings, and that the other half is produced as a result of the stimulus of milking.

Against this theory of the reflex secretion of milk, however, there are some strong arguments:—

(1) That no secretory nerves to the mammary glands have yet been discovered (Marshall[35]), and that milk secretion takes place when the mammary gland is transplanted to another part of the body (Ribbert[43]).

(2) That all the milk which is normally obtained at any milking from the cow is already in the udder before milking begins. Gaines and Sanmann[17] found this by slaughtering cows at the normal time of milking and comparing the amount of milk (by estimation of the lactose) contained in the udder with that which had been produced at the corresponding milkings on previous days. In fact, their results suggest that there is more milk in the udder than is obtained at any milking, for analyses showed 100, 96 and 118 per cent. in three cows. Gowen and Tobey[19] also did this on 20 cows, and the average showed an excess of lactose in the udder equivalent to 2·1 lb. of milk above the average yield which would have been obtained at that milking; this would be the quantity of milk which would in any case remain in the udder

Fig. I—Diagram of Milk Pressure in Udder (From Tgetgel)



after it had been milked "dry." Their conclusions were strengthened by the fact that the non-lactating udder does not contain any lactose. Filipovic[15] also came to the same conclusion by measuring the udder at different times after milking, as well as by other means.

(3) That, while the milk pressure in all quarters of the cow's udder rises when only one nipple is milked, the covering up of some of the nipples in a rabbit or guinea-pig with collodion, so that the young cannot suckle them, leads, not to an increased amount of milk in them, but to their atrophy in a few days, although the suckled glands maintain their full activity (Kuramitsu and Loeb,[33] Hammond[21]).

(4) That, if the decline in milk pressure as the milk is drawn off is measured, there is on the average a drop of 7·1 mm. Hg. for each 10 per cent. of the milk drawn off, independent of the length of the stimulus (milking) applied (Krzywanek and Brüggemann[30]). Moreover, these investigators found,[31] by determining the pressure in all four quarters while the two fore only were being milked, that after the initial rise in all four quarters at the beginning of milking, no further increase occurred in the hind, but rather a slight fall: which would not be expected if the act of milking caused the secretion of milk.

(5) That if, as suggested, about half the milk obtained at any milking is secreted during the act of milking, the gland would have to secrete some 60 times or more as fast as during the interval. A calf suckling some twelve times a day would then obtain much more milk than is obtained by milking three times, which is unlikely. Moreover, if milk secretion is stimulated by the act of milking, how is it that if the stimulus is applied a short time after the cow has been milked dry no more than a few drops are obtainable?

How, then, is the sudden rise in milk pressure at the beginning of milking caused? We believe that it is due to erection in the udder and nipples, which is caused reflexly by stimulation of the nipple by the act of sucking or milking, just as the erectile tissue of the reproductive organs generally reacts to such stimuli. This erection in the udder puts pressure on the milk contained in the alveoli and ducts, in which the milk is held up as in a sponge by capillary attraction, and so causes the rise of milk pressure which takes place at the beginning of milking. This is the act of "letting down" milk.

Somewhat similar theories have been advanced before by Nüesch,[38] Zwart,[64] and others, but these investigators believed that the reflex acts on the secretion as well as on the erection of the udder (*see* also Krzywanek,[32] Eich[13]). The means by which the erection is caused has been variously attributed to the filling up of the veinous network (Fürstenberg,[16] Riederer,[44] Rubelli,[46] Zietzschmann[60]), or to the contraction of unstriated muscle (Krupski[29]) or muscle and korbzellen (basket cells covering the alveoli) combined (Krzywanek and Brüggemann[31]).

In support of this erection theory of the "letting down" of milk, the following facts may be cited:—

(1) The nipples and udder generally contain a very large number of blood vessels and anastomosing veins, which if engorged with blood would be sufficient to cause erection of the udder (*see* work on the anatomy of the udder by Fürstenberg,[16] Rubelli,[46] Zietzchmann,[62] Glattli[18]). Moreover, it has been shown that the veins in the udder of the cow can contain, when filled, about half the blood in the body (Nelke[37]).

(2) By gently rubbing the nipples it can be observed, even in the male of some species (man), that erection occurs and they become firm and protruberent. This erection has been attributed (*see* Schafer[47]) to a muscular mechanism in the nipple.

(3) It can be observed that, when a sow lies down to let her litter suckle, there is a latent period before the milk is "let down," as would occur if some mechanism such as erection were involved in the process. For a short time there is a noise and commotion as the piglets nudge at the teats and the late arrivals are finding theirs: then suddenly all is silent and still—the milk is "let down" in all the nipples at the same time, to the late arrivals as well as the earlier.

(4) That there is a nervous connection between the nipples and the reproductive organs has been pointed out by Marshall,[35] who states that uterine contractions occur on putting the child to the breast. Conversely we have observed in lactating mares that sometimes during the act of service milk flows freely from the nipples. Nüesch[38] states that the erection reflex in the udder can be set up also by stimulation of the vulva, vagina or uterus, or by certain sights or sounds.

(5) It is difficult to see how otherwise the udder could be emptied of milk, for physically the minute diameter of the ducts with alveoli at their ends would hold up by capillary attraction a large proportion of the milk contained in the udder, unless some mechanism such as this is available to force it out. For example, when Zwart[64] inserted a catheter in the nipple and drew off milk (without stimulation of the nipples) he could only obtain about 40 per cent. of the milk, whereas when the udder was milked by hand (and the erection occurred) the remaining 60 per cent. was obtained. This 40 per cent., we suggest, consists of the milk contained in the cistern and large ducts, while the 60 per cent. consists of that obtained from the small ducts and alveoli. This is also supported by the different fat percentage found in these two fractions (*see* below, p. 525).

If a catheter is inserted in the nipples and the milk is collected continuously by this means over 24 hours the actual yield obtained during this time is less than would be obtained by milking (Dyssegaard[12]), because at the end of the period there would still be a large amount held up by capillary attraction in the small ducts.

The experiments which have been made in milking out the amputated udders of cows also seem to be capable of this explanation. Gaines and Sanmann[17] found that by milking an amputated udder only about a quarter of the milk was obtained, the milker complaining that "the udder was not milking naturally"; another quarter of the milk was obtained by drainage from the sliced udder; while the remaining half was tenaciously held even in the finely-ground tissue. These amounts agree very well with the proportions obtained by catheter and by milking (Zwart[64]). Ragsdale *et al.*[41] also obtained by milking amputated udders 69 per cent., 36 per cent., and 58 per cent. of the milk previously given at the milking when the animal was alive. Swett[50] and Swett, Miller and Graves,[52] from eleven cows in two *post-mortem* milkings and massaging at body temperature, obtained on the average 70 per cent. of the milk from them when alive. The higher amounts here obtained may be due to the special methods used. It was found by Rubelli[45] that the amount of fluid required to fill the large ducts and cisterns of the udder amounted to about 60 to 70 per cent. of the amount of milk which was obtained from the udder when the cow was alive. Swett, Miller and Graves[52] found that the cows which yielded the greatest quantity before death liberated a smaller percentage of that quantity after death. This, we suggest, is due to the greater proportion which would be stored in the alveoli and smaller ducts in such udders and so the smaller proportion which could be drawn off from the large ducts and cistern. This suggestion is borne out by the fact that they found that milk was drawn *post-mortem* more readily from small udders than from large ones: the small uddeus would have a proportionately larger cistern and large duct system than the large udders, in which the alveoli would be better developed (*see* p. 523).

Swett, Miller and Graves[53] also found that, after amputated udders, kept at body temperature, were milked out and fluid was injected into them, not more than, on the average, 44 per cent. of the injected fluid could be recovered, even when hand manipulation was combined with the use of a vacuum pump; that is, no matter whether the substance is milk or warm water, the fluid is held in the ducts and alveoli by capillary attraction and will not come out unless erection of the udder takes place as it does at a normal milking.

It has been stated (Bitting,[5] Wing[56]) that it is the "holding up" and not the "letting down"

of milk which is the active process and which is caused by muscles round the branching parts of the ducts. In our opinion, however, it is the "letting down" of milk which is the active process. The mechanism is, we would suggest, somewhat similar to that of erection of the penis. Afferent nerves take the stimuli to a centre in the cord from which the efferent nerves conduct the impulses to smooth muscle fibres (and perhaps also basket cells round the alveoli) running in conjunction with, or over, veins and by occluding the latter cause accumulation of blood in the tissues of the udder and nipples: this in turn causes increase of milk pressure within the alveoli, ducts and cistern. The udder is innervated from two sources: by spinal nerves (inguinal) coming from the second lumbar, and by sympathetic nerves from the lumbar plexus of the rami communicantes.

Like other similar reflexes, inhibitory influences can be exerted on this reflex by impulses coming from the brain. Thus if the cow is frightened by a dog or by strange surroundings, such as being at a show, the milk is not "let down," that is, the reflex is inhibited by impulses coming from the brain. Zietzschmann[62] states that this is also liable to occur to some extent in cows "on heat." Methods of overcoming such inhibitions, such as setting food before the cow, or scratching her back to put her mind at ease, are therefore frequently used for the purpose of assisting the free flow of milk. Indeed, even in normal milking in Switzerland and elsewhere a system exists of stroking the nipples for the purpose of obtaining a complete erection before the milking proper begins (Nüesch[38]); this should also give a better distribution of fat in the milk (*see* p. 525). From analogy with the process of erection in the organs of reproduction it may be supposed that there are conditions under which the erection of the udder is incomplete. Under these conditions the milk obtained will be below normal in amount, but, unlike subnormal amounts of milk resulting from nutritional disturbances, it will also be subnormal and not above normal in fat content, for, as is shown below (*see* p. 525), the proper erection of the udder is necessary for obtaining the fat globules which are held up in the small ducts.

The length of time for which the erection can be maintained without the muscles becoming fatigued is not known, but it is said that quick milking gives better results than slow, long-drawn-out milking (Bitting,[6] Crowther[10]). If, instead of the usual system of milking, the milk is drawn off completely from each quarter in turn (and the various quarters rotated at each milking) it is found that the quarter milked first gives the most and that milked last gives the least milk (Beach and Clark,[4] Emery[14]). This could be, and has been, explained by supposing that there were anastomoses between the ducts of the different quarters (Rubelli[45]), but injection experiments with coloured fluids (Bitting[5]) have shown that this is not correct. We believe rather that it is to be explained by the fact that udder pressure, owing to the erection, is highest when the first quarter is drawn and lowest when the last quarter is milked out (*see* also p. 525).

The fact that more milk per hour is secreted after short intervals than after long intervals between milkings, was found long ago by Kellner,[28] who found that the hourly rate of milk secretion was 5·29 grs. per minute during twelve-hour, 6·83 grs. during six-hour, and 9·25 grs. during two-hour intervals between milkings. He considered this to be evidence for the secretion of milk by the stimulus of milking, but as has been shown above, this view is now untenable. He also found, however, when the intervals between milkings were reduced to under an hour, that less and not more milk was secreted per hour (only 1·4 grs. per minute at 50-minute intervals), which he explains by assuming that "if repeated too frequently the otherwise favourable stimulus gives rise to pain"; we would suggest that this occurrence was due to lack of proper erection.

At all times milk should be drawn so that no discomfort to the cow is caused, and in this respect there is a great difference between milkers. Bitting[6] quotes Babcock to the effect that certain milkers get not only more, but also richer, milk than others from the same cow. This could also be explained on the erection theory (for fat per cent. *see* p. 525), as also could the differences that have been found by some (Schmidt, Lauprecht and Stegen[48]) between hand and machine milking.

Most of our cows to-day are so thoroughly domesticated that it is the exception (in highly strung animals of nervous temperaments) rather than the rule to find one in which the milk is not "let down" to the milker. When we look back into the early days of domestication, however (*see* Duerst[11]) we find that all sorts of arrangements were made to stop these inhibitions being set up which prevented the letting down of the milk; for example, by tying the calf to the fore end of the cow, the psychological effect on the cow is sufficient in many cases to overcome these inhibitions. Even to-day in the improvement of tropical cattle, living under semi-wild conditions, this problem of overcoming the inhibitions to the "letting down" of milk is one of primary importance (*see* Cousins,[9] Hammond[23]).

The Effects of Milk Pressure on Milk Production

It is well known that the easiest way to dry a cow off is to leave milk in the udder and seal

up the nipples. By some it is considered that this is due to the accumulation of the products of secretion as such in the alveoli, leading to the slowing down and cessation of production as at the end of a "mass action" chemical reaction. If this is so, this must be a local and not a general reaction, for one gland can be dried off independently of the others, as can be seen in a sow suckling a small number of pigs (*see also* Hammond[21]). By milking at different intervals of time it has been found by Ragsdale, Brody and Turner[41] that the rate of milk secretion decreases in each successive hour after milking to approximately 95 per cent. of that secreted at the previous hour. That this is due to the increase of milk pressure in the udder with the increase in time after milking (as suggested by Swett, Miller, Graves and Creech[51]) and not to the accumulation of the products as such (as suggested by Ragsdale, Brody and Turner[41]) is shown by the following facts:

(1) In cows suffering from milk fever, where it is required to stop the secretion of milk temporarily so as to give time for the blood calcium to become normal again, the udder is inflated with air and the nipples are tied off. This maintains a high pressure in the udder, which is equally effective as are the products of secretion in inhibiting milk secretion.

(2) In women, when for any reason it is desired to stop milk secretion without causing the glands to become pendulous and lose their shape through stretching by the contained milk, it is the practice to bandage the breasts tightly. The pressure thus applied externally stops milk secretion with a minimum of accumulation of the product within the alveoli and ducts.

It would appear to be the pressure, therefore, created by the accumulated milk rather than the chemical effect of its constituents within the udder which slows down the rate of secretion and eventually causes the cessation of milk production. We would suggest that the formation of pendulous udders in cows is the result of too high and long continued internal milk pressure, which stretches the tissues to such an extent that they do not regain their form afterwards. It is the heaviest yielding cows which suffer from this defect, for in cows in which the udder tissue is "fleshy" (fibrous) and has little elasticity, the udder does not expand as the milk pressure rises, and consequently the yield from such cows soon decreases owing to the high internal pressure. Krzywanek and Brüggemann[30], for example, found that in 33 cows the milk pressure in the udder varied from 25 to 8 m.m. Hg. before milking began. How far the shape, as distinct from the consistency, of the udder affects the milk pressure is not known, although Zwart[64] suggests that the pressure may be higher in rounded than in flat ones. The shape of the udder will be affected to some extent by the cistern size; for example, in heifers at mid-pregnancy before first calving, and before the expansion of the milk cistern, the nipple appears to be inserted directly into the udder. As the cistern fills with milk just before calving the nipple is projected from the udder by this expansion (*see* Hammond[22]). It has been shown by Bitting[5], Wirz[57] and others that there is a large variation in cistern size among cows. Swett, Miller, Graves and Creech[51], who made an investigation of the physical characters of cows' udders, found that the size of the cistern was inversely proportional to the size (empty weight) of the udder. That is, as the udder increases in size the volume of the alveoli and small ducts increases more in proportion to the cistern and large ducts. This has probably been the course of evolution in the development of the cow's udder, and suggests the reason why with our present-day high-producing cows there is more necessity to milk three or four times a day than with relatively low yielding unimproved cows. We consider that, since the efficiency of feeding for high milk production has risen to such a high level, further progress in obtaining larger yields of milk and butter fat is now being limited more by milk pressure than by any other factor.

The amount of the increase in yield due to more frequent intervals between milkings has been estimated by Bartlett[1] at about ten per cent. from twice-a-day milkings at twelve hour intervals to three-times-a-day milkings at eight hour intervals; but there are no figures yet available to show how this increase is related to udder pressure in different individuals. Boutflour[7], however, states that heifers respond better to three-times-a-day milking than do older cows; such a result might be expected if the unstretched state of the udder in the heifer tended to cause a more rapid rise of milk pressure. That the milk pressure is frequently higher in the udders of heifers than of cows is suggested by the fact that often a puffy swelling occurs in front of the fore quarters just before calving. This is probably a lymphatic oedema which is caused by the high milk pressure obstructing the flow of lymph in the lymphatic vessels which run from the fore to the hinder end of the udder, for it subsides when some of the milk is drawn off to reduce the pressure and massage is applied backwards and upwards over the udder.

During early lactation, too, when yields (and milk pressure) are high, the rate of milk (and to an even greater extent, fat—*see* p. 524) secretion is comparatively low from the ninth to 16th hours after milking; whereas in late lactation the rate of secretion from the ninth to 16th hours is nearly as rapid as during the first nine hours after milking. This Bartlett[2] found by comparing the ratios between afternoon (eight hour interval) and morning (16 hour

interval) milk; the ratio varied from 1 : 1·47 in the early stages to 1 : 1·66 in the late stages of lactation. In the same way he has shown that, when yields increase in May and June owing to seasonal changes, the yield obtained at the morning milking after the long interval shows much less response than that of the evening milking after the short interval, because there is not so much increase of milk pressure after the shorter interval. Thus, although the nutrition for the milk is present in the animal, milk is secreted at a slower rate because of the higher pressure which limits its production.

There is some histological evidence (*see* Hammond[20]) as to the mechanism whereby the increased milk pressure inhibits the rate of milk secretion and eventually leads to atrophy of the gland cells. In the empty gland the space occupied by the alveolus is small and the cells are columnar, their natural shape in which they can best carry out their physiological process of milk production. But when the alveolus becomes filled with milk under pressure the diameter of the alveolus is doubled so that the individual cells have to expand if they are to remain intact, and they become flattened and drawn out. Neither this, nor the occlusion of the capillaries on the outer side of the alveolus by the milk pressure within, is conducive to a high degree of physiological activity in the mammary cell. We also find such conditions of long continued pressure causing atrophy of cells in other positions in the body; for example, in cyst formation from Graäfian follicles in the cow's ovary the granulosa cells are destroyed by pressure of the liquor folliculi within and do not develop and form luteal cells as they do when the follicle ruptures and the pressure is reduced (*see* Hammond[22]).

The Effects of Milk Pressure on Milk Composition

It is well known that the percentage of fat in the morning milk obtained after a long interval is below that in the evening milk obtained after a shorter interval. It has been suggested by some that this effect may be caused by fat being absorbed back into the blood from the milk ducts after long standing in the udder; this, however, is very unlikely for if the absorption of any constituent occurred (*see* Muffet[36]) it would be that of the most diffusible one (lactose), and not fat which is the least diffusable constituent of the milk. Milk pressure is, we believe, the cause of these differences in the percentage of fat contained in the milk obtained after different intervals. The effects of milk pressure on the amount of fat produced, and on the composition of the milk, are caused in two ways: (*a*) By inhibition of the actual secretory process, in the same way as inhibition of milk production as a whole is produced, that is, by a flattening of the alveolar cells. (*b*) By affecting the ease with which the fat globules pass down the capillary ducts and enter the cistern from which they can be withdrawn. The evidence available in support of these two assumptions will now be discussed in turn.

(*a*) That increase in the milk pressure in the udder inhibits the production of fat to an even greater extent than it inhibits the yield of milk is shown by the variations in the fat percentage of the whole of the milk obtained at any milking. For example, Ragsdale, Brody and Turner[41] found that the fat percentage of the milk increased as the intervals between milkings were shortened, that is, as the pressure under which the milk was secreted became less. Under the various conditions where milk is secreted under high milk pressure in the udder the fat contained in it is less than under conditions where the milk is produced at low udder pressure. For example, Bartlett[2] has shown that the difference between the fat per cent. of the morning milk (3·0 per cent. obtained after a 16 hour interval) and the evening milk (3·55 per cent. obtained after an eight hour interval) is relatively greater at the 50th day of lactation (difference 0·55 per cent. fat) than it is at the end of the lactation period when the yield, and so the udder pressure, is less (morning 3·75 per cent., evening 4·0 per cent.—difference 0·25 per cent.). He has also shown that first calvers in early lactation (that is, in those animals whose duct system has not yet been stretched, and in which the milk pressure would be high) produce approximately the same (or even greater) weight of fat at the evening milking (after a short interval, and at low udder pressure) as they do at the morning milking (after a long interval, and at a high udder pressure), and that this condition gradually disappears with advance in lactation (as the udder becomes stretched and the udder pressure is reduced). Bartlett[2] also found that a lower weight of fat was produced at the morning milking (after the longer interval, with higher udder pressure) than in the evening milking in two cows which had developed very tight udders before milking, as compared with two cows in which the udders never appeared to be fully dilated before milking. The characteristic differences between the morning and evening fat yield he also found to be much less pronounced in May and June than at other times of year; the difference between morning and evening yield of fat in May and June was only 0·04 lb., whereas in December and January it was 0·08 lb. That is, the depression of the fat percentage which occurs at the time of increased rate of milk production shows up more markedly in the milk obtained after the long interval than after the short interval, because of the increased pressure to which it is subjected during the process of secretion.

It might be argued that more fat is secreted

in the milk produced as a result of the supposed stimulus of milking (as has been suggested by Nüesch[38], Zietzschmann[62], etc.) and that it is this which gives rise to the results quoted above. If this were so, however, we should expect that if a catheter were inserted in the udder and the milk was drawn off continuously (into a bag emptied at hourly intervals) for 24 hours without any stimulus from milking (except at the end of the whole period), then the total amount of fat produced would be less than normal since the stimulus occurred once only and not twice during the 24 hours. Such an experiment performed by Isaachsen[25] shows, on the contrary, that the total day's milk contained the very high percentage of 5·4 fat, made up of 4425 grs. milk containing 2·6 per cent. fat collected by catheter during 23 hours, and 4220 grs. milk containing 8·2 per cent. fat collected by hand milking an hour later. This higher content of fat, we would suggest, is due to the lower milk pressure under which the milk is secreted when the catheter is inserted. The high fat per cent. of the milk obtained by milking as compared with that obtained by catheterisation in this case is explained in the following paragraph.

(*b*) As we see it, the fat globules are held up by capillary attraction in the finer ducts to a much greater extent than the more fluid and heavier solids-not-fat and water, and it requires the increased pressure of an erection within the udder to dislodge them effectively from this position. As evidence for this view the following experiments may be quoted. If, as the milk is drawn from the udder, samples are taken for analysis at intervals (fractional milking) it is found that the fat percentage rises from the beginning to the end of milking, with an added acceleration towards the end of milking (Issachsen[25]). The cause of this and the importance of the erection of the udder for the discharge of fat from the smaller ducts and alveoli of the udder is shown by an experiment performed by Nüesch[38], although he himself attributes the results to differences between the composition of the milk formed during the interval and that which he supposes is produced on stimulation of the udder by milking. A catheter was inserted in the nipple (without erection of the udder) and all the milk which would flow freely (that is, the milk contained in the cistern and large ducts) was drawn off; the fat content both at the beginning and at the end of this withdrawal was the same (in three experiments 2·1 per cent. at the beginning and 2·4 per cent. at the end; 1·3 per cent. and 1·3 per cent.; and 1·3 per cent. and 1·26 per cent.). After this was done the catheter was withdrawn and the udder was milked by hand (accompanied by erection of the udder); the fat content rose immediately to 4·3 per cent. (from 2·4 per cent. at the end of the catheter withdrawal) at the beginning of milking and increased to 6·5 per cent. at the end of it. Isaachsen[25] has reported similar experiments.

Similar results have also been obtained by those who have milked amputated udders in which an erection cannot occur. Ragsdale *et al.*[42] from two amputated udders obtained only 16 per cent. and 46 per cent. of the fat obtained at the corresponding milking when the cow was alive, whereas they obtained 36 per cent. and 58 per cent. of the normal milk yield, that is, much of the fat and some of the milk was held up in the finer ducts by lack of an erection. Swett, Miller, and Graves[53] also found that the butter fat test of the milk obtained from amputated udders was on the average only about half as high as that obtained at previous normal milkings; the percentage of solids-not-fat, however, was practically the same in the first *post-mortem* as in the *ante-mortem* milk. As they point out, neither the quantity of the milk, nor the fat percentage in the milk which they recovered from the amputated udders was so high as those obtained by Petersen *et al.*[40], who milked out one half of the udder before death of the cow. This we would explain by the fact that in Petersen's cases an erection of the udder had been caused by milking half the udder before the animal was killed, and so the milk and fat globules contained in the alveoli and finer ducts were forced down by the erection into the larger ducts and cistern, whereas in Swett's cases no such erection had been caused. It is notable, too, that in Petersen's cases when fractional milkings were made from the amputated udders after erection had taken place (through milking one half of the udder before slaughter) the fat percentage in the milk rose to a maximum and then dropped again almost to the level of the first portion, that is, the last drawn milk because of lack of erection in the udder when it was being withdrawn contained less fat, and not more as is obtained in a fractional milking when the animal is alive.

Crowther's[10] results of fractional milkings in the living animal are in direct support of this explanation. He showed that when one quarter is milked out first the fat percentage rises regularly from the beginning to the end of the milking, but when the other quarters of this udder come to be milked out then the fat percentage varies very little from the beginning to the end of the milking; that is, the erection set up by milking the first quarter has forced the fat globules from the alveoli and small ducts downwards into the larger ducts and cistern where the pressure is less. He also showed that if all four quarters be milked simultaneously they behave as the first quarter does, that is, the fat rises from the beginning to the end of the milking; whereas, if the quarters are milked fractionally in pairs, the fat percentage of the pair milked first rises from beginning to end

while that of the pair milked last varies very little from the beginning to the end of the milking.

Thus, in the normal process of suckling, a calf drawing milk from one quarter would cause the fat to come down in the other quarters, so that, when it changed to them, it would obtain its proper share of fat, even though it did not suck the udder dry. That this is so has been maintained by Hittcher[24]; Wellman[55], however, who collected the suckled milk (fractionally) from an oesophageal fistula in a calf, found that the fat percentage rose from beginning to end as it did in a fractional milking. That is, it is not that suckling as compared with milking causes any difference in the composition of the milk, but rather that the composition of the milk obtained from any quarter will depend on whether it has been previously stimulated to erection or not. In the sow, an animal which is not normally milked, and which would not be likely to get an erection when the milk was forcibly drawn off, Ostertag and Zuntz[39] found that the milk obtained by drawing it off was only about half as rich in fat as that obtained by the young pigs sucking.

That the fat globules are held up in the finer ducts is also suggested by the fact that Bitting[6] found that the average size of the fat globule is slightly larger in the last drawn milk than in the first drawn milk; indeed, he found that in a cow killed immediately after milking "dry" the ducts contained a residue of milk very rich in fat. It has been found (Woods[58]) that the rate of milking has an even more pronounced effect on the fat percentage of the milk obtained than it has on the yield of milk (*see* p. 522), possibly owing to the erection being more effective when first initiated; that is, the effectiveness of the clearing out of the contents of the finer ducts has a greater effect on the fat percentage than on the yield because of their high fat globule content. Crowther's[10] experiments showed, for example, an increase of ten per cent. in milk yield ,and of 40 per cent. in fat yield by quick milking as compared with slow milking.

By two milkers milking all four quarters together there was on the average an increase of two per cent. in milk yield and six per cent. in fat yield over the ordinary method, despite the occasional disturbance (which lowered the average) of the cow, and so the degree of erection, by this unusual mode of milking. Probably for these same reasons, the quarter milked first almost invariably yielded richer milk than that milked last—in Crowther's experiments, 4·26 per cent. fat as compared with 3·10 per cent. fat.

This effect of quick milking on the more efficient emptying of the alveoli and finer ducts might, however, be explained on another basis than that of efficiency of erection, for the speed with which the ducts were emptied would affect the recoil of the elastic tissue in the udder, and so the additional pressure which would be put on the milk contained in the ducts to force it out—much as the subsidiary notch (dicrotic wave) in the pulse pressure curve is caused by the backflow of the blood before the closure of the valves of the heart occurs.

It would appear that much of the day-to-day variation in fat content of the milk may be caused by differences in the nervous reactions of the cow, and of the milker (as suggested by Bartlett[3]) resulting in variations in the completeness of erection and the emptying of the finer ducts. Thus Isaachsen[25] notes that special care should be taken in milking cows which are "on heat" if variable results are not to be obtained. The increased variability of the composition of milk which occurs during the first month of lactation, and particularly during the first few days after the calf is weaned (Bartlett[3]) is also attributable to the variations in the inhibition of the erection mechanism that occur when the cow is in a disturbed mental state.

The milk pressure developed in the udder by the secretion of milk during the interval between milkings affects the degree to which the fat is held up in the smaller ducts. This would be expected on physical grounds, for the difference in the specific gravity of the fat globules and of the solids-not-fat and water would result in their differential rates of passage down the capillary ducts according to the pressure against which the flow was made, that is, towards an empty milk cistern or towards one which was already filled. This occurs just as in the separation of cream by the centrifuging of milk, where the higher the speed, and so pressure set up by the centrifuge, the more completely is the fat separated from the solids-not-fat and water. So it is found that there is a greater difference in fat content between the first drawn and last drawn milk after a long interval (during which the milk pressure rises higher) than after a short interval (during which the milk pressure developed is lower). For example, Johansson[26], who studied the variations in fat percentage by the use of a special milking machine which automatically took continuous samples of milk during the process of milking, found that, whereas at the morning milking (with a high milk pressure—10·7 Kg. milk) the fat percentage of the first and last 2 Kg. milk drawn off varied from 0·7 per cent. to 8·6 per cent. (difference 7·9 per cent.), at the mid-day milking (with a low milk pressure—6·2 Kg. milk) it varied only from 3·6 per cent. to 6·5 per cent (difference 2·9 per cent.), and at the evening milking (with a low milk pressure—6·4 Kg. milk) it varied only from 2·5 per cent. to 6·0 per cent. (difference 3·5 per cent.).

Summary

(1) The causes and effects of milk pressure in the udder are of fundamental importance in explaining the physiology of milk and butter fat secretion.

(2) The whole structure of the cow's udder appears to be designed for the relief of pressure on the secreting cells.

(3) It is suggested that the "letting down" of milk is an active process brought about by a reflex causing erection of the udder and so pressure on the milk contained in the ducts.

(4) Increase of milk pressure slows down the rate of milk secretion and eventually stops it. The ways in which increased milk pressure affects, and is affected by, the structure of the udder are discussed.

(5) It is suggested that differences in the fat percentage of the milk are caused by milk pressure (*a*) through inhibition of the actual secretory process and (*b*) by affecting the ease with which the fat globules pass down the capillary ducts to the cistern from which they can be withdrawn.

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II.—The Development and Evolution of Milk Composition.

Introduction

During the course of the morphological growth and development of the individual, orderly changes take place in the proportions of the different parts of the body (*see* [6]), and these changes repeat in part the history of its evolution. Chemical changes in the composition of the body, such as the proportions of water, ash, protein and fat, have also been shown to behave in the same manner. It seemed probable, therefore, that the composition of milk would obey these same laws of development, and that differences in the composition of the milks of different species could be explained in terms of the changes in composition occurring during the inception of lactation in the individuals of one species. It is the object of this paper to explore this possibility, for, if the general direction of the evolution of milk composition can be determined, it will explain the variations in composition which now occur, or are likely to take place with the further development of the function of lactation.

The changes occurring in the composition of milk during the inception of lactation in the cow have been studied by Woodman and Hammond[18], Asdell[1], and Turner[15]. We propose to examine these changes and to compare the composition of the milk of different species in the light of these changes just as the morphologist would compare the proportions of the body of an animal, such as a horse, during the course of development with those of different species, both living and extinct. For example, in the horse, which has been developing for speed, the proportion of the cranium to the length of the limbs is large in the early stages, both of development in the individual and of evolution in the species; but as both advance the limbs increase in proportion to the cranium. In the same way if the proportions of the different constituents of milk are studied in both development and evolution, it will be found (*see below*) that well defined changes occur.

Just as during the course of morphological evolution certain species set out on a different course of development from the others, so also it will probably be found that in milk secretion evolution will not proceed in exactly the same way for all groups of animals. The nature of these groups and the manner in which they are developing still remains to be determined.

The morphological development and the evolution of the mammary gland will not be considered here as the evolutionary aspects have already been dealt with by Bresslau[2] and the changes occurring during development in the cow have been described (*see* Hammond[5], and Turner[14]).

Development in the Individual

The changes in the composition of the secretion of the mammary gland during the inception of lactation have been studied in most detail in the cow and will therefore be taken as the basis for discussion here.

With the development of the cells of the alveoli of the mammary glands (which begins in heifers, in calf for the first time, at about the 20th week of pregnancy) the nature of the secretions obtainable from the nipples changes from a lymph-like serous exudate (if any at all exists in the ducts) to a thick honey-like secretion rich in globulin (*see* Woodman and Hammond[18], Hammond[5]). As pregnancy continues this secretion gradually changes, in the manner described below, to that of normal milk; the rate at which this change occurs will depend, among other things, on whether or not the secretion is removed from the ducts. While in the cow the transition to a normal milk composition usually begins a week or so before parturition, in other species, such as woman, the time at which full development of the true milk secretion begins varies considerably in different individuals, and *in primiparae* frequently does not occur until after birth (*see* Widdows and others[16]).

In the cow, too, the full amount of milk, and to a minor degree the full development of the composition, does not occur until about 50 days after parturition, increase in quantity usually being associated with changes in composition. As with morphological characters (such as the proportions of muscle and fat to bone), the development of these changes in chemical proportions, and in the quantity of milk, can be speeded up by feeding; thus in heifers "steamed up" by heavy feeding before calving, milk may be formed in such quantities that the udder has to be milked before parturition, while under conditions of bad feeding of the heifer during pregnancy only a little milk is present in the udder at calving. Similar conditions are also often found in ewes.

In order to obtain a clear impression of the manner in which the proportions of the body change during development it has been found convenient to state the proportions of the various parts as a percentage of some part of the body which is relatively large in the early stages of development. Since the formation of globulin and albumin occurs as soon as the mammary glands start their pregnancy development, the amount of these substances present is used here as a standard by which to measure the rate of formation of the other constituents (*see* Table I, page 529). As many investigators who have analysed the milk of different species have not distinguished between albumin and globulin in their analyses, both have been used together.

Figure I (page 530) has been prepared on this

Table I.
Changes in the Chemical Proportions of the Milk during the Development of Secretion in the Individual.

Species and Stage of Gland.	Per cent. Globulin and Albumin in Secretion.	Constituents as a percentage of Globulin and Albumin Content.				
		Fat.	Water.	Lactose.	Casein.	Ash.
Cow—During first pregnancy—weeks—23 ...	17·61	—	39	—	21	—
(Asdell[1]) 27 ...	10·30	46	708	23	46	6
30 ...	9·10	37	832	32	54	7
33 ...	2·72	125	3,117	126	128	26
39 ...	1·27	283	6,664	315	309	—
40 ...	0·53	678	16,700	794	594	—
Normal milk	0·44	798	19,392	1,021	618	185
Cow—After calving— immediately	16·56	21	441	18	16	7
(Rogers[11]) 24 hours ...	6·25	76	1,290	46	72	16
72 ,, ...	1·03	396	8,392	398	323	99
Normal milk	0·44	798	19,392	1,021	618	185
Ewe—After lambing ... ... ½ hour ...	18·56	135	253	8	27	6
(Weiske and Kennepohl[17]) 19 hours ...	2·93	303	2,612	179	180	29
3 days ...	0·92	673	9,014	475	493	103
9 ,, ...	0·60	785	14,065	962	748	150
Goat—Pregnant 15 weeks	4·67	81	1,770	64	108	18
(Asdell[1]) Normal milk	0·87	696	11,365	630	435	103

basis from figures given by Asdell[1], who analysed the mammary secretions at intervals from conception to calving in a heifer pregnant for the first time. Table I also gives examples from other investigations. The act of milking at frequent intervals speeds up the rate of the changes, so that the composition shown at the various stages of pregnancy would be in advance of those found by milking different animals at these stages of pregnancy. The results, however, have the advantage that they show the course of the changes in the order in which they appear, and do not consist of the whole of the products formed by the cells up to the stage of pregnancy at which they were drawn off (*see* [1] and [13]). That the nature of these changes is also much the same in other conditions and species, is shown by the results (*see* Table I) obtained by Rogers[11] in a cow after calving, by Weiske and Kennepohl[17] in a ewe after lambing, and by Asdell[1] in a goat; that is, the relative proportions of the various constituents of the milks are approximately similar at the same levels of actual globulin and albumin percentage.

The actual percentage of albumin and globulin steadily falls with the advance in the development of milk secretion, and as this occurs there is a regular sequence of proportional changes in the other constituents (*see* Table I and Figure I). It should be noted that as this occurs there is also an actual increase in the rate of secretion from the cell (*see* Asdell[1] and Hammond[7]). As development proceeds the proportion of water increases, and the lactose increases to much the same extent. Although the casein increases in the same general way the curve of increase differs from that of the lactose in that there is proportionately more casein than lactose in the early stages of development. In the later stages the formation of the casein lags much behind the lactose, the difference increasing as the development of milk secretion proceeds. The fat stands in a position intermediate between the lactose and the casein during development. The proportions of the ash increase slightly with development, though not to the same extent as those of the other constituents.

The striking parallel between the lactose and water proportions, and the differences between the casein and lactose proportions as development proceeds are the outstanding features. These facts are more or less in agreement with Taylor and Husband's[13] conclusions, arrived at on other grounds, that as the rate of milk secretion increases the proportion of lactose and water in the milk is increased.

In cases of the production of milk low in total solids, which are becoming prevalent in some areas, it would therefore seem important to determine the relations between the various constituents of the milk in order to find out whether or not the cause is due to the rate of secretion.

Evolution in Different Species

Porcher[9] classifies the milks of different species into two groups as to whether casein or globulin and albumin are the predominant proteins in it, although, as he points out, this is an arbitrary classification and all grades between the two exist.

If the normal milks of the various species be

Fig. I—Changes in the Chemical Proportions of Milk in the Cow during the development of secretion in the individual. (Proportions shown relative to Globulin and Albumin).

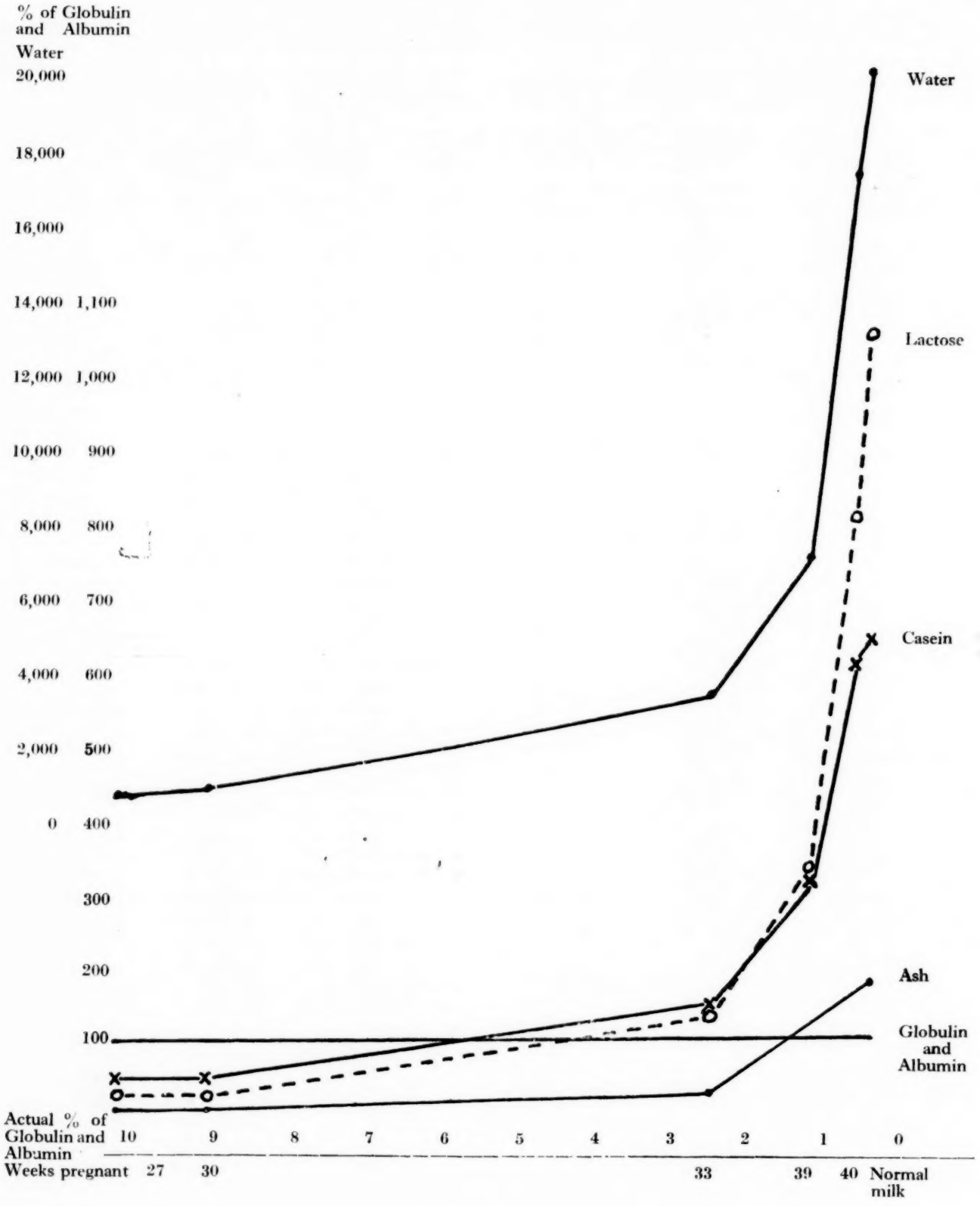


FIG II.—CHANGES IN THE CHEMICAL PROPORTIONS OF THE MILKS OF DIFFERENT SPECIES ARRANGED ACCORDING TO THEIR GLOBULIN AND ALBUMIN CONTENT. (Proportions shown relative to Globulin and Albumin).

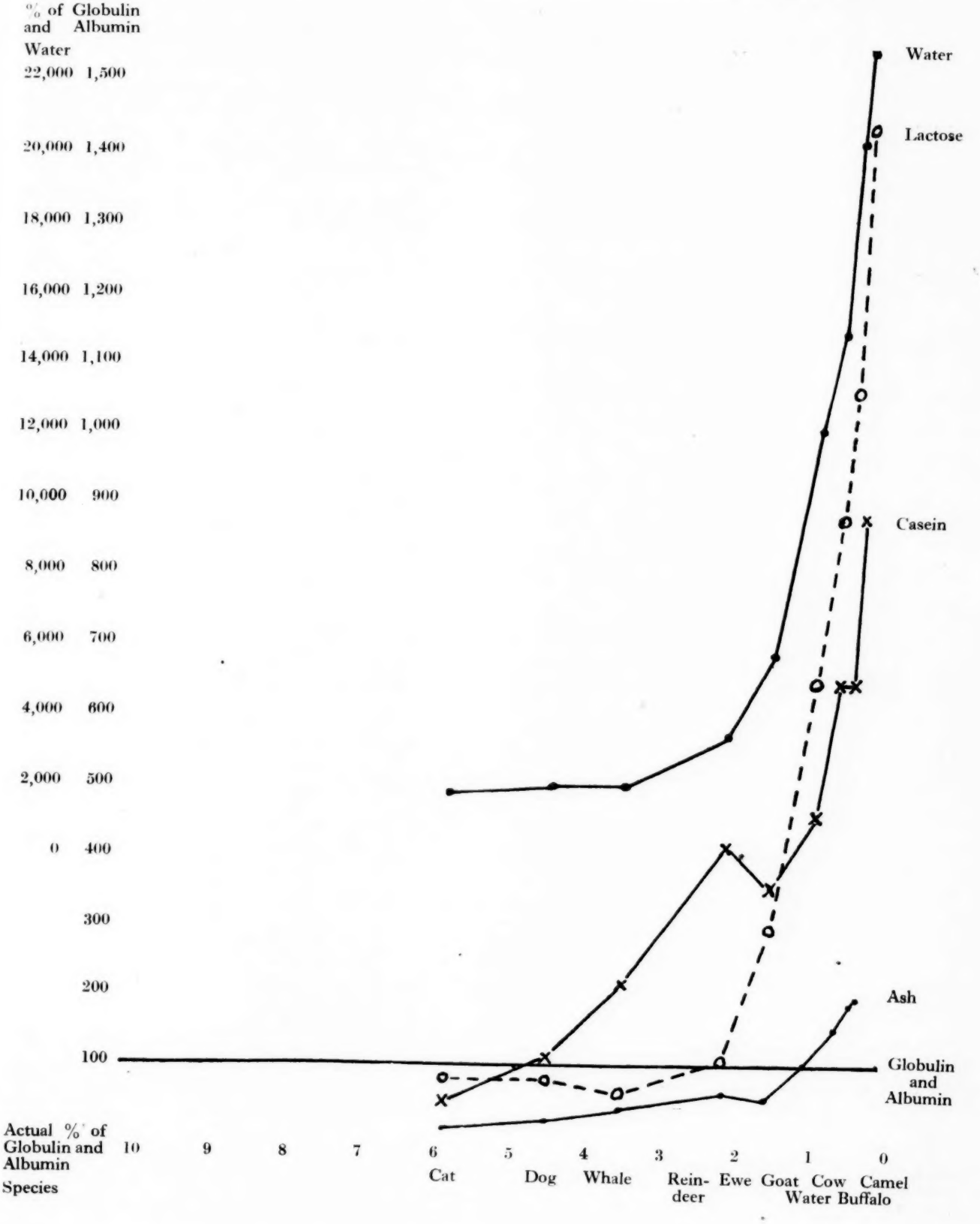


Fig. III—A Comparison of the Proportions of Lactose (relative to the Globulin and Albumin) in the Milks of Different Species with the Proportions which occur in the Milk of the Cow during the Development of Secretion by the Glands.

O - - - O = Cow A = Ass B = Water Buffalo C = Cat Cm = Camel D = Dog
E = Ewe G = Goat H = Woman M = Mare R = Reindeer W = Whale

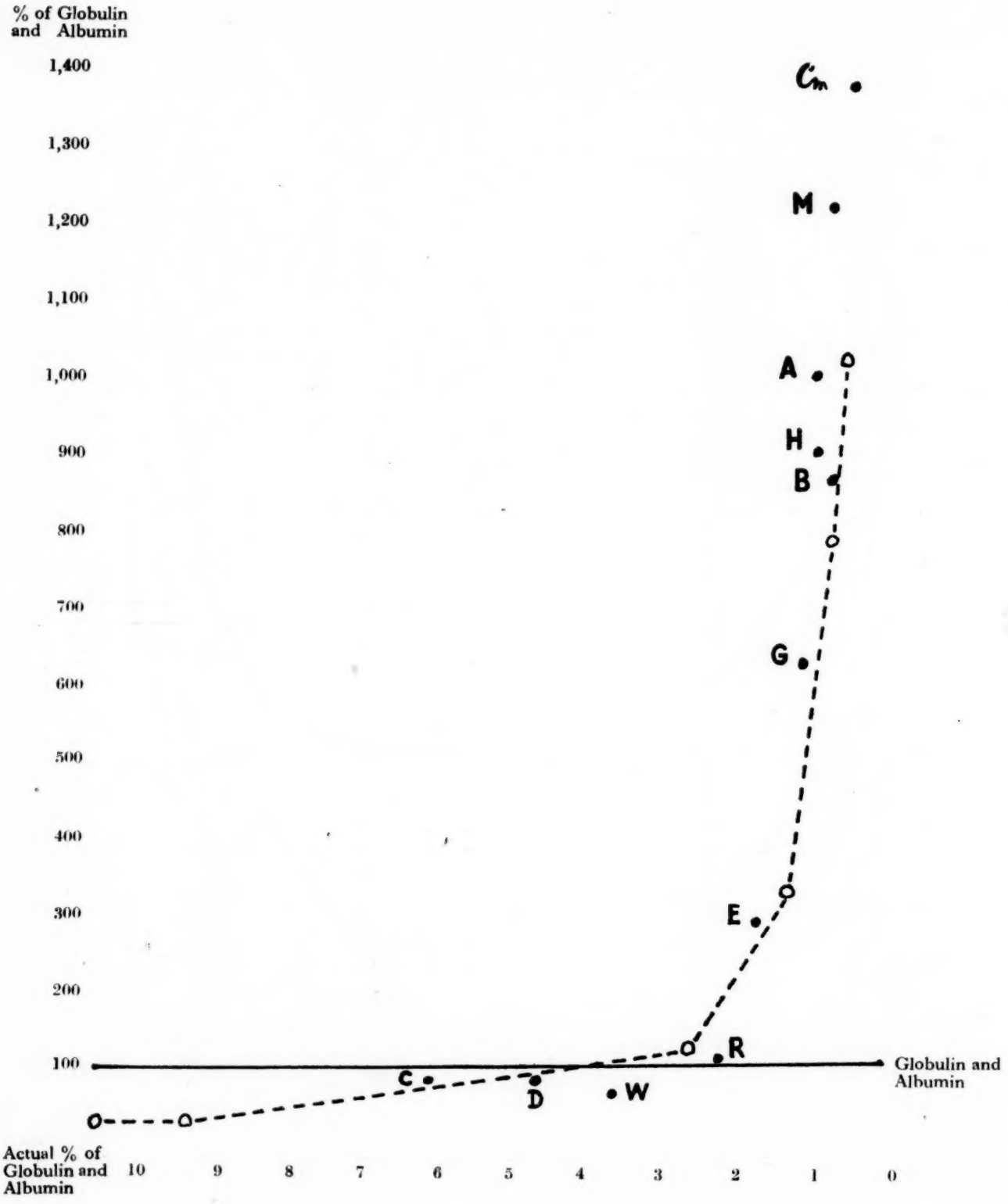
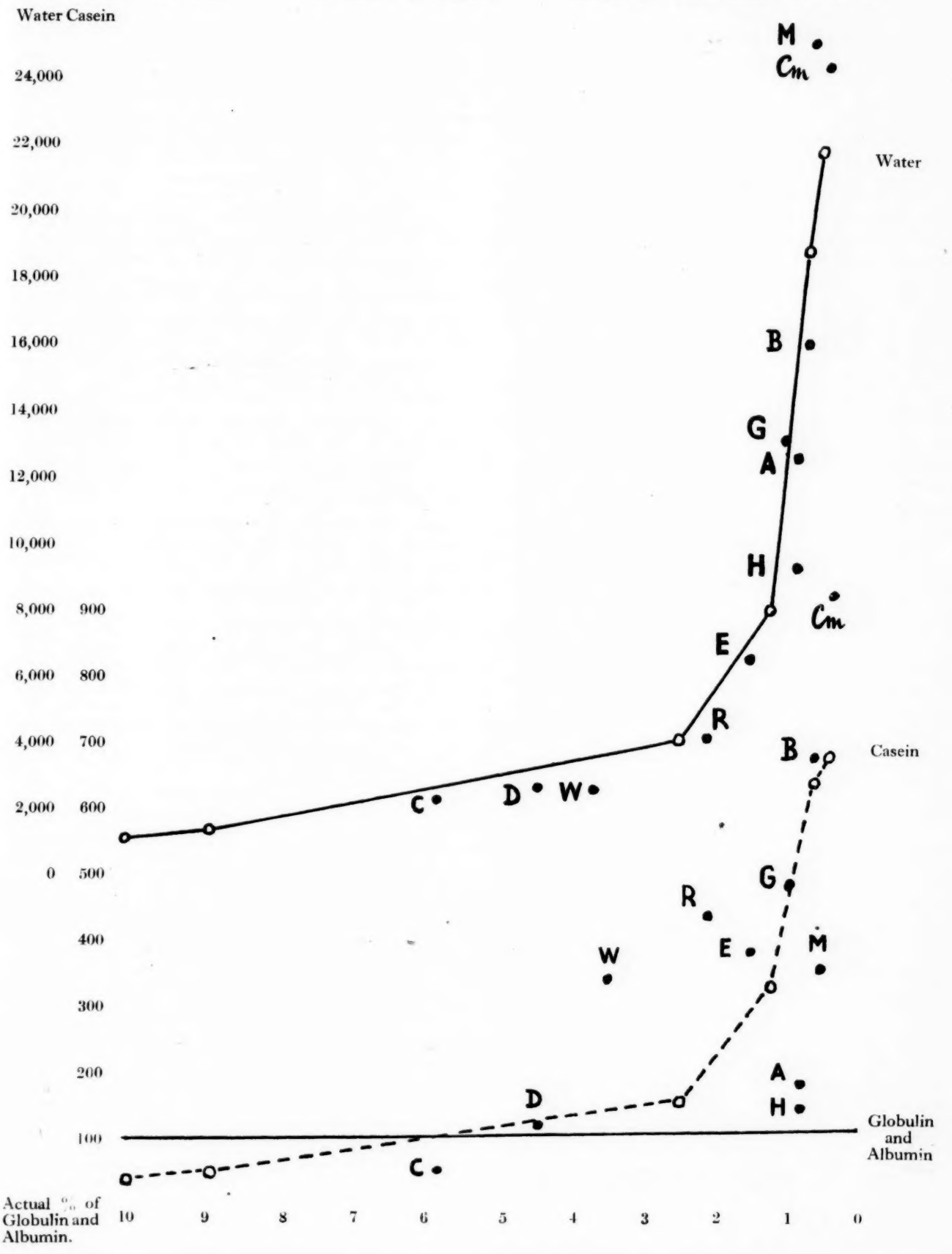


Fig. IV—A Comparison of the Proportions of Casein and Water (relative to Globulin and Albumin) in Milks of Different Species with the changes which occur in the Milk of the Cow during the Development of Secretion by the Glands



classified according to their actual globulin and albumin content, it will be seen (Figure II) that the proportions of the different constituents (excluding fat) vary in exactly the same way as do those of the cow during the development of milk secretion (Figure I). For example, as the percentage of globulin and albumin decreases in different species, the proportion of lactose relative to casein increases, just as it does in the cow during the course of development of milk secretion.

When the milks of different species are compared with that of the cow during development, at similar levels of globulin and albumin content, it will be seen, too (Figures III and IV) that the proportions of water and lactose are practically the same, while with two exceptions (whale and reindeer—*see below*) the values for casein are also similar. That is, the changes taking place in the composition of milk are similar whether they occur during the development of the secretion in the individual or in the evolution of species. There are, however, a few exceptions to this general statement among the milks of the different species of which we have been able to find analyses. For example, as will be seen in Table II and Figures III and IV, the milks of woman, the ass, and the mare seem to form a separate series, which change in much the same way but whose values for casein and ash fall below, and for lactose above, those of the cow of the same globulin and albumin content during development. As will be seen also in Figures III and IV the values for the whale and reindeer also show a slight tendency in the opposite direction. As with evolution in morphological characters, it is probable that the course of evolution is proceeding slightly differently in these two groups. It is to be noted (*see* Table II) that the fat differs from the other constituents of milk in that it does not seem to increase with any regularity throughout the series. How far this is due to difficulties in obtaining the true fat percentage (*see* Hammond[8]), and how far it is due to the different mode of formation of fat by the cell, it is not possible to say.

In order to obtain the composition of milk of the various species given here the literature was searched for records and the results (themselves often the mean of many analyses) from different authorities were averaged. Since many of these analyses were made some time ago, before good methods for separating the globulin and albumin were evolved, some slight modifications may be necessary when more accurate analyses are available.

As Porcher[10] points out, the importance of the different proportions of the various constituents in milk lies in the type of curd produced by rennet, and so in their digestibility. Experimental tests, among other by Espe and Dye[3] and Sheehy[12], have shown the importance of these curd reactions in the digestion of milk by human infants and calves respectively.

Conclusions

(1) A parallel can be drawn between the changes in the development of the composition of milk in the individual and the changes that have taken place during the course of evolution in different species.

(2) As globulin and albumin are formed first during the inception of lactation in the cow and other species, the changes in the proportions of the other constituents are considered in relation to the amount of these substances present in the milk.

(3) During the course of the development of milk secretion in the cow there are uniform and well defined changes in chemical composition; as the rate of secretion increases the percentage of globulin and albumin decreases and the proportions of water, lactose, casein

Table II.

Composition of the Milks of various Species (as a Percentage of Globulin and Albumin Content) arranged to show the Evolution of Chemical Proportions.

Species.	No. of Analyses Averaged.	Per cent. of Globulin and Albumin in Secretion.	Constituents as a percentage of Globulin and Albumin Content.				
			Fat.	Water.	Lactose.	Casein.	Ash.
Cat	1	5·96	56	1,370	82	52	10
Bitch	3	4·48	219	1,888	87	112	23
Whale	1	3·75	593	1,650	48	219	44
Reindeer	2	2·11	872	3,152	111	405	69
Ewe	4	1·51	535	5,345	293	347	63
Goat	4	0·87	696	11,365	630	435	103
*Woman	3	0·86	484	12,915	892	133	36
*Ass	4	0·81	209	14,853	1,029	175	73
Water Buffalo	4	0·60	1,210	13,919	849	627	150
*Mare	3	0·47	179	22,914	1,216	324	76
Cow	8	0·44	798	19,392	1,021	618	185
Camel	1	0·40	690	21,760	1,392	872	185

*Probably form a separate series by themselves, with a different lactose : casein ratio.

and ash rise. The proportion of lactose increases at a faster rate than the casein.

(4) When the composition of the milks of different species is considered in the same way it is evident that these milks (with few exceptions) have much the same proportional compositions as those of cows' milk during the course of development at similar globulin and albumin content levels. Moreover the lactose increases at a greater rate than the casein in the milks of different species as the globulin and albumin content of the milk falls.

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EDINBURGH DEGREE OF B.Sc. (VET. SCI.)

Students of the Royal (Dick) Veterinary College have passed in the following subjects of the course for the Degree of B.Sc. (Vet. Sci.) conferred by the University of Edinburgh.

Entomology and Parasitology.—Kenneth P. Anderson, Reginald Ford, Stanley T. Harriss and William M. Henderson.

Genetics.—William R. Anderson, George W. Argo, William Blanshard, Ian W. Cameron, Archibald R. Campbell, Michael A. Carmichael, Alfred T. Cowie, Donald M. Hood, Frank Jagger, Hubert B. Luxmoore, Eric Parker, Herbert B. Parry, Kenneth A. Ross, George H. H. Russell, George A. H. Williams and George S. Ziffo.

Anatomy.—Andrew M. Bain, George C. Brander and William B. Brownie.

* * * * *

There has been a considerable decrease in the number of cases of sheep scab in the Free State reported to the Department of Agriculture. Up to March 15th only 26 outbreaks were returned as contrasted with 92 during the corresponding period last year.

The Veterinary Record

April 25th, 1936.

THE PHYSIOLOGY OF MILK SECRETION

We feel sure that many of our readers will welcome an opportunity to read an article which presents a reasoned and critical review of the subject of milk and butter-fat secretion, such as that by Dr. John Hammond which we publish in this issue. This paper and that which follows it, are together, however, more than mere reviews; they go farther in that they incorporate many ideas which to a proportion of our readers at least must be quite new.

It will be well to consider certain points arising from them from an angle which is somewhat different from that dealt with by the author. Doubtless, to many of us, it will be somewhat difficult to reorientate our views of mammary activity, and the dairy farmer who has had a wide experience of practical milk production will find it even more difficult. It is essential, however, to read and consider this paper with an entirely unbiassed mind. If this is done, and if due weight is given to each of the arguments advanced, it will be very difficult indeed not to be convinced that Hammond's conclusions are more likely to be correct than are the older ideas.

Stated briefly, the first point is that the principle of a practically constant level of mammary activity between one milking and the next must replace the belief, hitherto held, that the udder of the cow secretes somewhere about two-thirds of its milk yield between milkings, and the remaining one-third or more *during* the actual process of milking. Secondly, that the process of "letting down the milk" is an active motor neuro-muscular function, caused either by an erection of the complicated network of plain muscle fibres or by a passive congestion of the vascular system of the gland induced by a hindrance to the outflow of blood in the large venous trunks; and that, conversely, the "holding up of milk" is an inhibition of this active neuro-muscular mechanism. It is unnecessary to repeat the evidence advanced in support; this will be read in the author's papers. It may be desirable, however, to indicate one or two ways in which the conclusions may be put to practical uses.

The stroking and massage of the teats necessary to effect reflex erection, which is pro-

vided probably most efficiently by the calf when sucking, might well receive more attention by those who employ milking machines. It may be that the more constant the mechanical pulsations imparted by the machine, the less efficient is the mammary erection, and the less is the milk let down. This may well be the reason for the well-known inability of the milking machine to effect satisfactory "stripping." To revert to the calf once more, everyone knows that when the normal, healthy calf has sucked the udder practically dry, it commences a series of vigorous punches, and thereby obtains more milk. The same "punching" process is indulged in by lambs especially, and foals and piglings to a somewhat less extent. In each case, the immediate result is a further but temporary supply of milk. Eventually the punching is too vigorous to be tolerated by the dam and she moves away. It would seem logical to conclude, in the light of the evidence advanced by Hammond and others, that this punching may very well serve as an extra stimulus to erection of the udder, and that thereby a little more of the residual fat-rich milk is obtained. It should not be beyond the powers of human ingenuity to test the effect on the yield of a vigorous stimulating massage applied when three-quarters or more of the milk has been withdrawn, and again at the end of the normal milking. By such measures as would provide an added terminal stimulus to erection, the stripping disadvantage of milking machines might well be overcome.

In so far as internal mammary pressures are concerned, Hammond has gathered together available evidence and from a consideration of this together with his own conclusions, it appears more important than ever that milkings should be evenly spaced throughout the 24 hours. Under practical conditions this presents some almost insuperable difficulties. Perhaps the most serious of these is that concerned with labour. Where three evenly-spaced milkings are desirable for heavy-yielding cows, the system of 4 a.m., 12 noon, and 8 p.m. milkings may appear feasible on paper, but it is difficult to persuade all except the most conscientious of milking staffs to work these hours without extra compensation. Probably trade union officials and the advocates of modern principles of rationalisation in labour have not yet encountered such problems as this, which science can produce, but it seems not unreasonable to assume that they will ultimately arise to add to milk producers' troubles. As in other instances where different considerations pull in opposite directions, some sort of a compromise will probably ultimately be effected.

In our "Notes and News" columns there will be found a short abstract of three papers recently communicated to the Royal Society. These papers must be regarded as preliminary to further study of the precursors of milk found in the circulating blood.

In the meantime, it is interesting to note that the phosphorus-containing fractions of milk derive their phosphorus from the *inorganic* phosphate of the blood plasma, and that such relatively large amounts as up to 30 per cent. of the blood sugar are withdrawn and converted into lactose on passing through the mammary gland. The statement that some 300 to 400 volumes of blood must pass through the gland for each volume of milk secreted is arresting and serves to emphasise the great importance of a robust and adequate circulatory system in the heavy milking cow.

The technique employed in the investigations is a comparatively simple one, and it seems worth suggesting that practitioners might use internal iliac artery injection as a convenient means of introducing antiseptic solutions into immediate contact with the diseased tissues in such conditions as acute gangrenous mastitis.

It would not be difficult to add others to the above thoughts which come to mind on reading these papers, but probably enough has been said to emphasise the importance of this week's number of the *Veterinary Record* to those whose work brings them into intimate contact with milk and milking cows. Opportunities may arise for some to test the validity of a number of the views put forward; if so, it is to be hoped they will take advantage of them and in the course of time communicate results to our columns in the interests of scientific progress.

VETERINARY UNIT IN ABYSSINIA

The veterinary unit which the R.S.P.C.A. recently sent to Addis Ababa has established a clinic hospital for animals, and it is now in full working order. The society is sending a second veterinary surgeon, Mr. G. E. Owen, formerly of the veterinary service of the Nigerian Government, to assist in the work.

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A train carrying 600 Irish cattle was proceeding up a steep incline outside Princes Pier Station, Greenock, when a coupling broke. The runaway wagons crashed into a empty passenger train standing in the station. An engine was derailed, nine of the cattle waggons were smashed, and about 60 animals were killed or had to be destroyed.

Abstracts

[**Torsion of the Uterus.** (Trans. title.) Hibma, A. M. (1935.) *Tijdschr. Diergeneesk.* **62.** 13. 669-703.]

The author first gives a few case records of torsion of the uterus in ewes, of which he has seen four instances in 270 cases of dystokia in this animal.

The main part of the paper, however, is devoted to a theoretical discussion on the mechanism of torsion. Hibma believes that the pregnant horn does not become twisted as a whole, but that the disorder begins at the tip of the horn, which for an obscure reason becomes displaced towards one or other side. If it moves towards the left side across the abdominal wall a twist to the right (of the horn as a whole) is produced.

The broad ligament exerts tension on the tip of the pregnant horn and as the tip moves to the side so this tension increases and the main part of the horn tends by its weight to fall deeper to the side, suspended as it were between the body of the uterus and the tense broad ligament inserted into the extremity of the horn. In a twist of small extent—90°—the foetus is not greatly displaced, but in a twist of 270° or more the extent of twist of the body of the uterus and the strong constricting action of the stretched broad ligaments forces the foetus away in a forward direction, thus intensifying the dystokia.

Theoretically there are two ways of correcting a torsion at parturition by the rolling method. A torsion to the right can be reduced by laying the dam on her right side, quickly rolling her into the dorsal position and letting her down gently on to her left side. The uterus is thus "left behind" at the first rapid part of the rolling and the slow end of the movement prevents the uterus from gathering any momentum by which it would resume its position of torsion.

The second way is to place the dam on her left side and to roll her to the left, beginning gently and hastening the movement progressively, so ending it with a sudden stop with the dam on her right side. The rolling motion is transmitted to the uterus during the roll and the momentum thus acquired continues after the body has come to rest, so that the uterus untwists itself. The twist, of course, can be reduced much more easily if it is possible to secure leverage on the foetus by its presenting limbs.

In the light of the above theory the opposing opinions of practitioners—whether to roll in the direction of the twist or the other way—are not in practice so conflicting as would at first appear to be the case. The consensus of opinion of writers on veterinary obstetrics, however, is "roll in the direction of the torsion."

J. E.

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[**Presence of Acetone in the Meat of Bovines.** (Trans. title.) Haudiniere, M. A. (1935.) *Bull. Acad. vét. France.* **8.** 4. 233-238.]

The author instances a carcase of beef which had an offensive smell. This smell persisted over 24 hours and continued even when the meat was cooked. By testing the urine and the muscle chemically it was supposed that this odour was related to abnormal quantities of ketone bodies. To confirm this a comparison was made between the muscle of this meat and that of normal flesh. The sodium nitro-prusside test for ketone bodies was performed on a watery extract obtained from the samples of muscle. All gave a reaction, slight in the case of the normal meat but very pronounced in that obtained from the affected carcase. A quantitative test showed that the abnormal meat contained nearly twice the amount of ketone bodies as an average sample of normal meat, but without more information he was unable to say whether this increase was physiological or pathological.

This condition is most likely to be encountered by meat inspectors when cattle and sheep are killed soon after parturition, for it is chiefly with *post-partum* affections that an acetonaemia and acetonuria are found. As the odour persists when the meat is kept and even when it is cooked it is most objectionable to the consumer and carcases so affected should be condemned.

G. J. G. H.

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[**Bovine Phthisis: Incidence in North-east Scotland.** Griffith, A. S., and Smith, J. (1935.) *Lancet.* **229.** 1339-1342.]

Tubercle bacilli have been isolated from the sputum in 103 cases of pulmonary phthisis in human beings in Scotland. Of the strains which were isolated, 12·6 per cent. were of bovine type. The bovine type was only isolated from cases occurring in the counties of Aberdeen, Banff and Moray. Out of 13 strains isolated from cases in the Orkney and Shetland Isles, all were of human type.

E. J. P.

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[**Available Methods for Examination of the Blood of the Fowl.** Olson, C., junr. (1935.) *J. Amer. Vet. Med. Ass.* **86.** 4. 474-487.]

In order to determine the most suitable procedure for the examination of the blood of the fowl, a comparative study was made of five methods for the enumeration of erythrocytes and leucocytes, two methods for the

enumeration of thrombocytes, and four methods for the estimation of haemoglobin. The data were then subjected to statistical analysis.

The methods of counting blood cells compared were those of Blain, Shaw, Forkner, Wiseman, and that utilising Toisson's solution. The instruments for the measurement of haemoglobin used in the comparative study were the photo-electric haemoglobinometer of Sheard and Sanford, and the haemoglobinometers of Newcomer, Dare and Tallqvist.

The five methods of counting erythrocytes had nearly the same degree of accuracy; but the Wiseman method was slightly more accurate and consistently gave slightly higher erythrocyte counts.

Of the three direct methods of counting leucocytes that using Toisson's solution gave the most consistent results. The direct methods of counting leucocytes cannot be used for abnormal blood, such as in erythroleucosis, and of the two indirect methods used Wiseman's was the more suitable. The two methods for the counting of thrombocytes gave similar results.

The photo-electric and Newcomer haemoglobinometers were in close agreement on measurement of the haemoglobin of the chicken. The Newcomer instrument gave higher values than were obtained with the photo-electric instrument, but this difference was consistent. The photo-electric haemoglobinometer appears to be applicable to the measurement of chicken haemoglobin without alteration, and translation equations for the conversion of the readings of one instrument to the other are given. The Dare and Tallqvist haemoglobinometers were not considered suitable for the accurate measurement of the haemoglobin of the chicken.

R. F. G.

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[Cross Species Transmission Studies with Different Strains of Bird Pox. Irons, Y. (1934.) *Am. J. Hyg.* **20.** 329-351. (2 tables, 36 refs.)]

Fowl-pox, pigeon-pox, turkey-pox and vaccinia have been compared in their pathological and immunological reactions. Serial passage of pigeon-pox viruses in the fowl enabled their adaptation to this species, and one out of three fowl-pox viruses was similarly adaptable to the pigeon. One of four pigeon-pox viruses was made to infect English sparrows, ground sparrows, canaries and snow buntings, repeated passage causing a shortening of the incubation period and an enhancement of virulence. Turkeys were readily infected with fowl-pox, and turkey-pox was easily transmissible to fowls but not to pigeons. The lesions set up by an adapted virus were similar to those set up by the natural virus type for the host; for example, fowl-adapted pigeon-pox virus injected intravenously caused generalised lesions such as those seen after similar use of fowl-pox virus. As the passages increased the virulence for the new host, so the virus became less active for the original host, but serial passage in the proper host permitted a reversion to the original pathogenic characters.

Guinea-fowls, ducks, hawks, owls, crows and starlings were found insusceptible to all of the viruses tested. The author was unable to demonstrate neutralising properties in hyper-immune sera sufficient to permit experiment. When actual infection was caused by any one type, an immunity obtained against the other types. Vaccinia is distinguishable from bird pox on histological as well as immunological grounds, and there appears to be no direct relationship between the two conditions.

N. H. H.

Reports

[Alan, Duke of Northumberland Memorial Fund: Second Report of the Management Committee. Stewart, W. Lyle, with foreword by the Rt. Hon. the Earl Grey of Howick.]

It was decided in 1931 that the memorial to the late Duke of Northumberland should take the form of encouragement and assistance for the investigation of animal diseases, more particularly diseases of sheep, of a non-notifiable nature which were the cause of serious losses in Northumberland. The income available for this purpose was to be provided by the annual interest on the capital sum raised by public subscription. The management of this income is vested in a committtee, under the chairmanship of the Rt. Hon. The Earl Grey of Howick, and representative of the many interests concerned. The veterinary profession is represented by two members of the North of England Division, N.V.M.A.

In a foreword to the report Earl Grey mentions that the income from investments, for the financial year ending July 31st, 1935, was £120. Subscriptions by societies, landowners and farmers amounted to £132, making a total of £252. "This sum enabled a certain amount of very useful research work to be done. A larger income would add to the value of the experiments, which could be planned on a larger scale." A small grant was received during 1935 from the Agricultural Research Council to enable investigation to be made into the braxy-like diseases of sheep.

A notable development in the work of the Fund has been the establishment of a system under which subscribers may receive *through their own veterinary surgeons* sheep biological products of proved efficacy, at a cost of from one-quarter to one-third below ordinary retail

prices. Members of the North of England Division, N.V.M.A., have agreed to act as distributors of these products. Slight adjustments in the working of the scheme may be found necessary as experience is gained, but it may be anticipated with confidence that one important result of the venture will be to effect closer contact between flockmasters and veterinary practitioners.

The report, written by Mr. W. Lyle Stewart, M.R.C.V.S., deals with the following conditions which have received attention during the year: lamb dysentery, Border pining in sheep, the eradication of ticks, cripples in lambs, and the control of internal parasites.

Lamb Dysentery.—Reference is made to the vital importance of proper veterinary supervision in the control of this disease. During 1933 and 1934 complaints were received that the standard treatment had proved less effective than usual. On one farm out of 500 lambs born, 100 were said to have died from dysentery, despite the fact that each lamb received serum at birth. Few *post-mortem* examinations had been made, and the owner had not called in his veterinary surgeon. It was decided to retest the value of the standard treatments on a large scale during the lambing season of 1935, and arrangements were made for supervision to be exercised by veterinary practitioners. Seventeen farms were selected where the death-rate from dysentery in 1934 was said to have been at least ten per cent. On some farms no treatment had been given previously, but on others unsatisfactory results had followed the administration of lamb dysentery antiserum. The results may be summarised as follows:

Treated Sheep

Ewes vaccinated	3,527
Lambs born	4,892
Lambs died from lamb dysentery ...	18
Percentage loss	0·36 per cent.

Untreated Controls

Ewes unvaccinated	1,752
Lambs born	2,367
Lambs died from lamb dysentery ...	169
Percentage loss	7·14 per cent.

The importance and value of veterinary supervision is evident from these figures, which were obtained only after the cause of each individual death had been ascertained by *post-mortem* examination, followed where necessary by bacteriological examination. The scheme to supply flockmasters with biological products at reduced prices, obtainable only through their veterinary surgeons, was the direct result of this field experiment.

Border Pining.—For many years the precise nature of this malady has remained obscure, though many farmers have come to regard the trouble as the direct result of some deficiency in the pastures upon which the sheep graze. Their method of control has been to change the flocks on pining farms at periodic intervals to different pastures. "Pining" sheep were examined, the faeces were found to contain large numbers of the ova of parasites, and in every case the presence of large numbers of small thread worms in the stomach and small intestine was detected. Surprise is expressed that these parasites had not been observed by earlier investigators, and the suggestion is made that material benefit should follow the systematic treatment of sheep for the control of these parasites. With this advice there will be general agreement, and the development of further investigation into the relationship between parasitic infestation and the nutritional state of the host will be awaited with interest.

The Eradication of Ticks.—Experiments in dipping hill sheep were carried out, using a new anti-tick dip containing arsenic. Details of the experiment are given, and it is stated that tick counts were made each week between March 13th and the end of May. A graph showing the results obtained on one of the four farms selected for dipping is included. This shows a very marked decrease during the week following dipping, followed by a rising curve to the date for the second dipping, when tick counts on dipped sheep are shown as 40, compared with 20 from undipped animals. A further fall occurs after the second dipping, to be followed by a rise to 80 in both treated and untreated sheep at the third dipping, during the eighth week of the tick season. One year's experience is too short a period to enable any very definite conclusions to be drawn concerning the efficiency of this new method of control. One hopes that future work will show the significance, if any, of the features in the graph to which attention has been called. A small number of ewes with lambs at foot were dipped with no appreciable ill effects.

Mr. Lyle Stewart was able to collaborate in this work with Dr. J. MacLeod of the Moredun Institute. An appreciation of their assistance is accorded by the Management Committee to Dr. J. Russell Greig, Dr. MacLeod, and to Messrs. Robert Young and Sons, Glasgow, who supplied the special dip used in the experiment.

Cripples in Lambs.—No new work has been undertaken during the year, although observations were continued during the 1935 lambing season.

The Control of Internal Parasites.—Attention is called to the use of nicotine, combined with copper sulphate, for the treatment of internal parasites in sheep.

Throughout the report emphasis is laid on the benefits which may be expected to accrue

to the flockmaster following closer co-operation with his veterinary practitioner. Mr. Lyle Stewart is to be congratulated on a concise and readable report, intended primarily for the subscribers to the Fund (copies may be obtained from Mr. Stewart, Armstrong College, Newcastle-on-Tyne), and the efforts of the Management Committee, taking as they do a wide view of possible future developments, are entirely worthy of commendation.

J. R. R.

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[Bihar and Orissa. Annual Report of the Civil Veterinary Department for the year 1934-35. (Superintendent, Government Printing, Bihar and Orissa, Patna, India. Price Rs. 1-3-0.)]

Staff.—The report is submitted to Government by Major P. B. Riley, the Director of Veterinary Services. He was absent on leave for part of the period, when Mr. R. T. Davis, the Principal of the Veterinary College, officiated for him. In addition to the director there are three officers in charge of ranges and one disease investigation officer.

The principal and four professors constitute the superior staff at the Veterinary College. The subordinate staff consists of 13 veterinary inspectors and 146 veterinary assistant surgeons.

Disease.—The year was, on the whole, a healthy one, and the figures are regarded as the more satisfactory as there was a marked improvement in the reporting of diseases. An outbreak of anthrax in horses was found to be due to infected grass supply.

The cost of inoculation against rinderpest has been further reduced by the extended use of goat virus. In view of the longer immunity obtained also the method promises to be useful.

There were 33 veterinary hospials and 134 field veterinary dispensaries at work. There was a large increase in the number of patients treated at these institutions and by the touring staff. The number of castrations performed also showed a considerable increase.

The Disease Investigation Officer conducted experiments with a view to determining the dosage of goat virus for rinderpest and the deviation of immunity conferred. He investigated outbreaks of distomatosis, bilharziosis, and avitaminosis in fowls, among other activities.

The Veterinary College.—The number of admissions was satisfactory and 47 students were undergoing instruction at the end of the year. Post-graduate training was temporarily suspended for unavoidable reasons. In the Research Laboratory research on *kumri* was continued.

The Patna cattle breeding and dairy farm registered another year of successful working, but it is reported that the water supply for irrigation is causing anxiety.

G. K. W.

NATIONAL VETERINARY MEDICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND

Quarterly Meeting of Council

A meeting of Council of the National Veterinary Medical Association of Great Britain and Ireland was held, with the President (Captain J. R. Barker) in the chair, at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2, on Tuesday, March 31st, 1936.

The following members of Council were present: Messrs. H. Bell, H. W. Steele Bodger and H. E. Bywater, Captain J. C. Coleman, Mr. D. G. Davies, Major Brennan DeVine, Messrs. J. B. Dier, H. M. Duff, E. P. Edwards and J. Fox, Captain O. V. Gunning, Sir Frederick Hobday, Major Hamilton Kirk, Messrs. W. W. Lang, W. R. McKinna, J. W. McIntosh, G. P. Male and T. J. Margarson, Captain G. Dunlop Martin, Mr. J. W. Hall Masheter, Professor W. C. Miller, Professor W. M. Mitchell, Major-General Sir John Moore, Mr. R. Barons Nelder, Major R. H. H. Over, Major D. S. Rabagliati, Captain E. Brayley Reynolds, Captain J. R. Rider (Hon. Secretary), Dr. J. T. Share-Jones, Captain R. Simpson, Messrs. A. Spicer and H. P. Standley, Major F. J. Taylor, Messrs. W. Tweed, S. B. Vine, T. Wilkinson, T. Wilson and W. Woods, Professor G. H. Wooldridge, Dr. W. R. Wooldridge and Captain W. G. Wragg (Hon. Treasurer), together with Mr. C. O. Langley (Solicitor) and Mr. F. Knight (Secretary).

At the outset of the proceedings, the President pointed out that at the last meeting certain members omitted to sign the attendance register; he trusted that there would be no such omissions in future from the official record.

The minutes of the January meeting of Council, having been printed and circulated, were signed as correct.

Arising from them, the Secretary said that it would be remembered that Mr. Howard Dawes undertook to approach Mr. G. E. Bowman, of Leeds, with a view to getting the latter to withdraw his resignation from the Association. Mr. Bowman had replied to Mr. Dawes stating that he felt obliged, with much regret, to adhere to his decision owing to failing health. Mr. Bowman's resignation was accordingly accepted with regret.

Also arising, the Secretary reported that at the last meeting two resignations were received from membership of the Parliamentary Committee, namely, those of Mr. Steele Bodger and Major Dunkin, but only one vacancy was then filled by the appointment of Major Taylor; there remained, therefore, one vacancy on the Parliamentary Committee.

The Council unanimously elected Mr. Bywater to the vacancy.

Proceeding, the Secretary stated that at the January meeting of Council a Special Sub-committee was appointed in connection with the organisation of veterinary services in Shropshire, and the following was the report of that Special Sub-committee:—

ORGANISATION OF VETERINARY SERVICES IN SHROPSHIRE

The special sub-committee set up by the Council for the purpose in January last, met at the Grand Hotel, Birmingham, on Monday, January 20th, to consider the position which has arisen in Shropshire in consequence of changes recommended by the Chief Veterinary Officer, the adoption of which would have the effect of depriving the part-time veterinary officers of the bulk of the work for which they were at present employed.

The President occupied the Chair, the other members of the sub-committee present being, Mr. H. W. Steele Bodger, Mr. H. W. Dawes and Major DeVine.

Previous to the meeting the sub-committee had been supplied with a copy of the Chief Veterinary Officer's report and also with a copy of a statement commenting thereon which had been submitted to and discussed with, a sub-committee of the County Council by a deputation representing the veterinary practitioners of the County on December 31st, 1935.

After the members of the sub-committee had expressed their views and in the light of subsequent discussion, it was decided to communicate with the Clerk to the County Council in terms agreed upon. It was further decided to send a copy of the letter to the Chief Veterinary Officer, inviting his observations and expressing the hope that he would co-operate with the Association in finding an amicable solution of the difficulties.

Correspondence which had passed between the Association and the Clerk and the Chief Veterinary Officer of the County Council having been read, the PRESIDENT invited Mr. Tudor Hughes to speak to this matter.

Mr. TUDOR HUGHES, complying, said that in the first place he would like to thank the Council for intervening in that matter and bringing the weight of the Association to bear on the question. At the February meeting of the County Council, this item was tucked away, in the financial part of the agenda, under a report from the Sub-committee of the Public Health Committee, wherein it was recommended that consideration of the suggestion that two whole-time assistant veterinary officers should be appointed to assist in the work in connection with the Accredited Herds Scheme under the Milk (Special Designations) Order, should be deferred. He believed that there was a strong feeling in the County Council upon the question, and a prominent alderman, before the meeting had come to that item on the agenda, got up and spoke against the restrictions and requirements imposed on the milk producers in Shropshire by the Medical Officer of Health; his proposal that a sub-committee should be appointed to review that matter was carried, and the latter had suggested that there should be appointed an assistant whole-time veterinary staff. The question was still in abeyance, however, and he would appeal to that Association still to exert its weight in the matter and do what it could on behalf of the practitioners of Shropshire.

In reply to Mr. Steele Bodger's enquiry as to whether he wished the Association to take any further steps at the moment, Mr. Tudor Hughes said that he thought that it was a case of marking time for the present: whether the matter would come up at the meeting of the County Council at which the annual budget was brought forward he could not say, but if any information came to hand it would be forwarded immediately.

The PRESIDENT observed that there was a letter from Mr. McKee, the Chief Veterinary Officer of the Shropshire County Council, in which he asked to be supplied with a copy of the N.V.M.A. scheme for carrying out the recommendations of the Economic Advisory Council's Committee on Cattle Diseases: this had been supplied.

After some further discussion, it was decided to refer the matter to the Special Sub-committee with plenary powers to act.

The HON. SECRETARY enquired if any information was available as to the precise number of questionnaires issued in connection with the interim report of the Special Committee on Free Services and how many had been returned to date.

The SECRETARY: "The number of questionnaires sent out was 2,366 and 294 replies have been received."

Proceeding, the Secretary said that some time ago a Special Committee was appointed to consider the salaries of the holders of various whole-time appointments, including appointments under the Ministry of Agriculture and Fisheries. Information had now been received as to the salaries attaching to the latter, and he had brought that matter forward to ascertain if the Special Committee, which was one appointed by that Council, should have power to deal with that matter.

On the proposition of Major RABAGLIATI, seconded by Dr. WOOLDRIDGE, it was resolved "That the Special Committee be given power to act with regard to the consideration of the salaries of holders of appointments under the Ministry of Agriculture and Fisheries."

CORRESPONDENCE

(1) From the following members of Council, apologising for their inability to attend the meeting: Professor G. F. Boddie, Dr. O. Charnock Bradley, Mr. Donald Campbell, Lieut.-Colonel J. A. Dixon, Mr. P. F. Dolan,

Major A. C. Duncan, Mr. Arthur Gofton, Mr. John Holroyd, Mr. L. Hughes, Mr. E. F. McCleery, Major J. G. McGregor, Professor J. Macqueen, Captain S. J. Motton, Mr. W. Nairn, Mr. C. E. Perry, Captain A. W. Noel Pillers, Mr. Horace L. Roberts, Mr. G. A. Sangster, Mr. R. H. Smythe, Major A. Spreull, Major J. H. Taylor, Dr. A. W. Whitehouse and Mr. J. D. Whitty.

On the proposition of Major Kirk, the Council unanimously agreed to send messages of sympathy to Captain A. W. Noel Pillers and Mr. Donald Campbell, who were absent through illness.

(2) From the Private Secretary, Buckingham Palace, stating that the message of sympathy on the death of King George V, forwarded on behalf of the Association, had been transmitted to the Home Secretary for submission to His Majesty King Edward VIII.

(3) From the Secretary of the Royal College of Veterinary Surgeons, dated January 13th, 1936, addressed to the Secretary in the following terms:—

"In reference to your letter of October 9th, I beg to inform you that I circulated copies of the report and recommendations made by your Special Committee on Fur-Bearing Animals and Birds to the members of Council prior to the meetings last week.

"The matter was carefully considered by the Examination Committee, when I was instructed to inform you that the matter referred to has already received full consideration by the Council of the College, and that the present syllabus of instruction and examinations for the Diploma of the College make adequate provision for the purpose.

"This decision was confirmed by the Council at its meeting held on Friday, January 10th."

(4) From the Town Clerk of Hove, dated January 20th, 1936, renewing the invitation sent by the Council of Hove to the N.V.M.A. to hold their Annual Conference in Hove during 1937.

This communication was referred by the Council to the Annual General Meeting.

(5) From the Secretary of the Royal (Dick) Veterinary College, Edinburgh, dated January 6th, 1936, as follows:—

JUBILEE OF PRINCIPAL O. CHARNOCK BRADLEY

"At the close of this Session Dr. O. Charnock Bradley will have completed 25 years as Principal of the College, and it is felt that the occasion should not be permitted to pass without some adequate recognition. It is generally acknowledged that Dr. Bradley's services, not only to the Veterinary profession but also, through it, to Agriculture and Public Health have been eminent and far-reaching. A preliminary meeting of the Governors and staff, under the Chairmanship of Sir Thomas Hudson Beare, has already been held. At that meeting it was decided to invite the co-operation of representatives from interested Bodies with a view to determining by what means this unique occasion could be most suitably commemorated.

"I have accordingly been instructed to invite your Body to appoint a representative to act on the Committee which is in process of formation, and shall be glad to hear from you at your convenience.'

The Secretary observed that he had consulted the President in this matter and, on his instruction, had invited Captain A. Young, Vice-President of the Association for Scotland, to represent the Association on the committee, Captain Young having readily agreed to do so.

The President's action in this matter was approved.

MEMBERSHIP

The Secretary reported that the number of members on the register of the Association after the last Council meeting was 1,758; deductions for death and resignations reduced that number to 1,750. There were, however, 53 members who sought election, and that would bring the total membership to 1,803, which compared with 1,698 at the last April meeting of Council.

These figures were received with applause.

Obituary List.—The Secretary read the obituary list, Council standing in silent tribute the while: Mr. W. W. H. Edwards (Craven Arms), Mr. G. M. Mitchell (Sunderland), Mr. F. Warren (Tunbridge Wells) and Lieut.-Colonel H. T. Ryan (Cork).

Resignations.—The following resignations were submitted: Mr. J. Brown (Isle of Man), Mr. W. Hill (Dunstable), Mr. W. J. G. Jones (Newry) and Mr. E. Sayer (Newport).

The Secretary added that while Mr. E. Sayer had resigned, his son, Mr. B. Sayer, had become a member of the Association.

The President, replying to Major Kirk, said that the Secretary assured him that the usual efforts had been made to retain those gentlemen in membership, also that in no case was there any association between resignation and the policy of the N.V.M.A.; the resignations had been submitted for health, financial or other reasons.

It was left to the officers of the Association to take whatever steps seemed to them feasible to endeavour to retain these gentlemen in membership.

Election of New Members.—The following were unanimously elected to membership of the Association, on the proposition of Dr. Wooldridge, seconded by Mr. Tweed: Messrs. R. N. C. Aitken (Blantyre), James Baird (Glasgow), J. L. Buckingham (Halesworth), D. M. Cochrane (Penzance), J. G. Crowhurst (Loughborough), L. W. Coulden (R.A.V.C.), J. Cubby (Alderley Edge), B. E. Davies (Walsall), R. E. Dean (Belfast), C. Dickson (Romford), R. Ford (Edinburgh), T. Sealy Green (Shaftesbury), W. G. Green (Oxford),

Miss R. M. Henderson (Liverpool), Miss Audrey Hickman (Rickmansworth), Miss E. I. Hollander (Stafford), Mr. D. Howie (Glasgow), Miss B. Hutton (Hampstead), Messrs. F. V. John (Pontyclun), N. W. Keith (Wotton-under-Edge), H. N. Kellas (Chelsea), K. G. L. Knott (Bournemouth), T. Y. Littler (Canterbury), W. J. McCubbin (Edinburgh), H. McEnhill (Dungannon), John Mackay (Cockermouth), I. McLaren (R.A.V.C.), J. Milne (Mintlaw Stn.), A. T. Morgan (Swansea), H. Munro (Fearn), J. L. O'Connell (Ballyphephan), D. N. O'Neill (Newry), C. W. Ottaway (Camden Town), C. W. Perrin (Folkestone), Miss R. Ransome-Wallis (Worksop), Messrs. D. Richardson (Stevenage), R. W. Ross (Southport), Miss K. M. Sanderson (St. Albans), Messrs. B. Sayer (Newport), B. Serebrisky (Palestine), Miss M. R. Silverman (Shirley), Miss A. B. Slade (Nayland), Messrs. I. B. Smellie (Blantyre), W. C. Smith (Minehead), J. Spreull (South Africa), John Stewart (Ashbourne), Miss M. E. Strong (Kelsall), Miss D. W. Taylor (Dalkey), Miss P. E. M. Thompson (Wallasey), Messrs. S. Lloyd Trevor (R.A.V.C.), J. A. J. Venn (Aylesbury), J. McW. Ware (Crouch End) and James Wright (Belfast).

Reports of Standing Committees

Organising Committee

Mr. R. Barons Nelder (Chairman) read and moved the reception and adoption of the following report of this committee, Major Kirk seconding:—

The Organising Committee met at the offices of the Association on Monday, March 30th, with Mr. R. Barons Nelder in the chair.

The minutes of the previous meeting were read and signed as correct.

The committee again considered a letter from a Division referring to a case of cruelty to a horse by its owner and an official of a certain society offering free treatment for animals, and the request of this Division that inquiries should be made as to why this matter had been allowed to drop.

As the committee have been unsuccessful in obtaining details of the case from the member who brought the matter before the Division, they regret that they are as yet unable to deal with this request.

Consideration was given to a communication relating to a proposed "panel scheme" for dogs. The committee came to the conclusion that the scheme afforded a basis for discussion and they have therefore appointed a sub-committee to meet the promoter and to report back to the committee.

The committee were pleased to learn that Major D. S. Rabagliati had agreed to represent the Association on the Parliamentary Science Committee, together with Dr. Wooldridge, and letters were read from the Parliamentary Science Committee enclosing copies of questions affecting the veterinary profession they had caused to be raised in Parliament recently together with the answers thereto.

The Association's membership of the Parliamentary Science Committee has been renewed for the current year.

After consideration of a letter from the British Science Guild, the committee decided to support a memorial which that body proposes to send to the Civil Service Commissioners regretting their decision to omit "Everyday Science" from the qualifying examination of the Administrative Group Examinations, and to advise the Parliamentary Science Committee that the Association would support any action that that committee might also take.

The following resolutions, submitted by the Central Division, were laid before the committee:

(1) "That the schemes for the free treatment of the sick animals of the poor have such an important bearing on the welfare of the profession that the N.V.M.A. should immediately call together a committee to investigate the matter, and that all Divisions be asked to nominate members to serve on the committee.

(2) "That on grounds of common humanity the animals of the poor, when sick and in pain, are entitled to have proper diagnoses and treatment of their illnesses by members of the Royal College of Veterinary Surgeons just as much as are the animals of the well-to-do and that it is inhumane that they should be experimented upon by unqualified persons."

As the first step in the consideration of Resolution 1, it was decided to request Secretaries of Divisions to furnish certain information on scheme in their areas, the drafting of this request being left in the hands of the Chairman and the Hon. Secretary.

With regard to Resolution 2, the committee expressed themselves as being in full agreement with its principle.

In the same connection, a letter was read from a Division bringing to the notice of the Association the refusal of a Branch of the R.S.P.C.A. to grant the Division representation on any of their clinic committees. It was agreed to seek the assistance of Colonel Simpson in this matter.

The Secretary reported that in four cases of advertising by unqualified persons, counter-advertisements had been inserted in the newspapers concerned, and authority was given for similar action in a case that had just arisen.

The motion was carried without discussion.

Appointments Committee

The report of this committee was read as follows by Major DeVine (Chairman), who moved its reception and adoption, Captain Simpson seconding the motion:—

A meeting of the Appointments Committee was held at 2, Verulam Buildings on Monday, March 30th, under the chairmanship of Major Brennan DeVine.

The minutes of the previous meeting were taken as read and signed as correct.

In the light of recent information, the committee agreed that no further action could usefully be taken in regard to the appointment of a county veterinary officer, which post had been accepted by a non-member at a salary below the Association's scale.

It was agreed to recommend, however, that should the holder of this appointment apply for membership while in the employ of the said county council, his application should be refused.

With regard to the appointment of a veterinary officer, in a northern county, as no reply has been received to letters addressed to the holder

of the appointment (who had accepted it at a salary below the Association's scale) requesting him voluntarily to resign his membership of the Association. the committee asks the Council to pass a resolution recommending to the next Annual General Meeting that this person's name be struck off the roll of members of the N.V.M.A.

Renewed consideration was given to a letter from a Colonial member concerning a new scale of salaries for future appointments to the Colonial Veterinary Service.

It was agreed to make further inquiries, and for this purpose the following sub-committee was appointed with power, if it thought fit, to interview the Colonial Office: The President (Captain J. R. Barker), the Chairman (Major Brennan DeVine), Dr. W. R. Wooldridge, and Mr. S. B. Vine.

The committee approved the action of the Chairman in authorising the despatch of a letter to the Town Clerk of a Lancashire Borough in support of an application made by the Corporation's veterinary officer for an increase in salary.

It was agreed to accede to the request of the County Veterinary Officer of Renfrewshire that a copy of the Association's scale should be sent to the county clerk for transmission to a committee which had been appointed to consider the question of salaries.

It was decided to circulate to members of the committee, for their information, copies of the circular letter which, on the suggestion of the Society of Medical Officers of Health, had been addressed to selected medical officers of health (including the medical officer of health, Renfrewshire) enlisting their support and co-operation in the efforts of the Association to secure the adoption of its scale for all present and future veterinary appointments.

The President having declared the report open for discussion, Major Kirk said that in view of the action taken with regard to the county veterinary officer (referred to in the report) who accepted a position at a salary below the Association's scale, he would like to ask if the whole-time officer who accepted a similar appointment, with another county authority, which was also under the Association's ban, was still a member of the N.V.M.A.

The Secretary replied that that was so, but the appointment in question was accepted before the Council passed, and published in *The Veterinary Record*, its resolution in January, 1935, warning members that if they accepted appointments below the Association's scale they would render themselves liable to be reported to the Council of the N.V.M.A.

Mr. Steele Bodger observed that in connection with the reference in the report to the action which had been taken with regard to the appointment of a veterinary officer of the northern county (referred to in the report), one must regret that the holder of the appointment had had to be requested to remove his name, but he would like to ask the stage which the sub-committee of the Appointments Committee had reached which was reconsidering the whole question of this scale of salaries. It was obvious to most members that there should be some sliding scale for county appointments. What was a fit and proper remuneration in a large and wealthy county could not be held to be a fair one for a poor county, and, in his view, it was a pity that the Association had to keep banning appointments which many of them felt would not be banned in the absence of such a ruling as was made by the existence of the present scale for whole-time county appointments. He would therefore ask that the work of that sub-committee be expedited.

The Secretary stated that the report of the Salaries Sub-committee was laid before the Council at its last meeting. With regard to the revision of the scale, the statement was made that the sub-committee was of the opinion that while no change should be made in the lowest minimum figure in each section, the scale would be less liable to misinterpretation if the wording recommended by the sub-committee was employed. The scale was revised in certain particulars and the Council adopted the sub-committee's report.

The President said that that was at the last meeting of Council, in January, 1936.

Mr. Steele Bodger thanked the President, stating that he was not aware of that; indeed, he did not now know quite where they stood in regard to that matter.

The President said that before he put the report of the Appointments Committee he thought he would require a special resolution to go forward to the Annual General Meeting. The committee asked the Council to pass a resolution recommending to the next Annual General Meeting that the name of the member concerned in the northern appointment be struck off the list of members of the N.V.M.A. Would Major DeVine formally propose that?

Major DeVine moved accordingly, Mr. Bywater seconding, and the motion was carried.

The President added that if there was no further discussion on the rest of the report he would put it to them that the report be adopted. (Agreed.)

Veterinary Officers and Public Health Committee

The following report was read by Major Rabagliati (Chairman), who moved its reception and adoption, Captain Simpson seconding:—

The Veterinary Officers and Public Health Committee met at the offices of the Association on Tuesday, March 31st, with Major D. S. Rabagliati in the chair.

The minutes of the previous meeting were read and signed as correct.

The committee was informed that the Council had agreed that it should consider, in the light of present-day legislation and developments, the various methods of tuberculosis eradication already in operation and make a report thereon, and a discussion took place on the arrangements to be made in preparation for this. It was decided, however, to defer consideration of this matter for three months.

A communication was read from the Scottish branch giving particulars of a scale to be paid to private veterinary surgeons for carrying out in Scotland tuberculin testing under a proposed revised Attested Herds Scheme. It was stated that this scale had been approved by the branch after discussing the matter at the request of the Department of Agriculture for Scotland, on the understanding that any scale should apply equally to both England and Scotland, and that therefore the branch desired to be associated with any further negotiations that may take place regarding the scale.

It was agreed that in the event of a similar scale being offered by the Ministry of Agriculture, it should be accepted by the Association for application in England and Wales.

Correspondence was laid before the committee which had passed between the Association and solicitors acting for a member of the Holland County Council with regard to certain statements, to which the part-time veterinary inspectors had taken exception, made by this councillor at a meeting of the Holland County Council.

The committee endorsed the action taken on behalf of the Association, but as the Association's demand for a public withdrawal of the statements in question had not been met, it was decided to refer the matter to the Association's solicitor and that his opinion be placed before the President and the Chairman of the committee for any necessary action.

A letter was read from the Secretary of the Cheshire Veterinary Inspectors' Section of the Lancashire Division with regard to tuberculin testing in the county under the Milk (Special Designations) Order, 1936.

It was agreed that a letter to the effect that it is the opinion of the Association that such testing should be carried out by practitioners in collaboration with the whole-time veterinary officers, where such exist, should be sent to the county council and that copies thereof should be sent to the chief veterinary officer to the county and the Secretary of the Cheshire Veterinary Inspectors' Section.

Invitations were placed before the committee to appoint delegates to the annual conferences of the National Association for the Prevention of Tuberculosis and the Royal Institute of Public Health.

The committee recommends that these invitations be accepted and that in each case the delegate be the President or his nominee.

The Hon. Secretary drew the attention of the committee to the fact that certain wholesale chemists were selling tuberculin and syringes direct to farmers, or soliciting purchase. It was pointed out that the recent Diseases of Animals Acts makes provision for the control and regulation of the manufacture, importation and sale of therapeutic substances and it is understood that tuberculin will be among the substances to be controlled by Orders to be made under the Act.

In reply to a member, *re* paragraph 4, the President said that he understood that those fees referred to tuberculin testing under the Attested Herds Scheme after the herd had been attested, and in that case payment would be made direct to the practitioner by the Ministry of Agriculture. It should be remembered that the scale only referred to Scotland at the present moment.

Major Kirk asked what legal action it was contemplated might be taken in regard to the statements alleged to have been made by a member of the Holland County Council at a meeting of that council to which a meeting of the part-time veterinary inspectors had taken exception.

The President replied that the correspondence before the committee relative to that matter required a little elucidation by the Solicitor before any decision could be arrived at in regard to it.

Major Kirk enquired if it was not a fact that the Association had made a demand for the withdrawal of something said in public and that the member of the county council concerned had refused to withdraw; before the opinion of the Solicitor was received and action taken months might have passed.

After further discussion, the Council endorsed the action of the committee in seeking the view of the Solicitor and agreed that, following upon its receipt, the matter should be left in the hands of the President and the Chairman of the committee, who were empowered to take any action that they deemed to be necessary.

The report of the committee was then adopted.

Parliamentary Committee

The report of this committee was read as follows by its Chairman (Captain Coleman), who moved its reception and adoption, the motion being seconded by Mr. Nelder and carried without discussion:—

A meeting of the Parliamentary Committee was held at 2, Verulam Buildings on Tuesday, March 31st, Captain J. C. Coleman occupying the chair.

The minutes of the previous meeting were read and signed as correct.

As arranged at that meeting, the Government Committee on the Consolidation of Local Government and Public Health Enactments has been reminded of the representations made by the Association in 1931 urging an amendment of Clauses 116-119 of the Public Health Act, 1875, so as to invest the veterinary officer or veterinary inspector with the same power as the medical officer in regard to the inspection and examination of meat. It has been learned, as a result, that the Government Committee have not yet dealt with the provisions in the Public Health Acts relating to food, but that the Association's representations will be brought before them when they consider this branch of the law.

The committee decided to make representation to the Ministry of Agriculture requesting that where notices are served under Article 6 of the Improvement of Livestock (Licensing of Bulls) Act, 1931, requiring that rejected bulls should be slaughtered or castrated, the Ministry in such cases should insist on a qualified veterinary practitioner carrying out the castration and, if necessary, supplying the Ministry with a certificate in respect of the operation.

Correspondence has taken place between the Association and the Hornchurch, Merton and Morden, Ilfracombe, and Solihull Urban District Councils with regard to a clause in Bills promoted by them providing for the inspection of infected stables by the medical officer.

It is understood that following opposition by the Royal College of Veterinary Surgeons by

petitions to Parliament, two of the four authorities have undertaken to make the alteration suggested, namely, that this work should be done by a registered veterinary surgeon.

It was decided to inform the Royal College that the Association supported them in their action and was prepared to join in any further action.

It was agreed that the Association should continue to co-operate with the Royal College of Veterinary Surgeons in any further steps they may decide to take with a view to securing for veterinary surgeons the same position under the Dangerous Drugs Acts and Regulations as is occupied by medical men.

It was also the feeling of the committee that representations should be made to the Home Office that when a vacancy in the Poisons Board occurs it should be filled by a member of the veterinary profession.

Finance and General Purposes Committee

Professor Wooldridge (Chairman) read and moved the reception and adoption of the following report of this committee:—

A meeting of the Finance and General Purposes Committee was held at 2, Verulam Buildings on Friday, March 6th, 1936, with Professor Geo. H. Wooldridge in the chair.

The minutes of the previous meeting were read and signed as correct.

Arising from the minutes, a letter was read from Lieut.-Colonel P. J. Simpson expressing his deep appreciation of the resolution passed by the committee thanking him for his services during the time he had acted as Chairman.

A report was received on the joint meeting which had taken place at 10, Red Lion Square, on January 8th, between representatives of the Association and the Special House Committee of the Royal College of Veterinary Surgeons. The committee agreed to the recommendation made in the report, that the Joint Committee be continued in office with a view to enquiring further into the desirability of combining to secure premises suitable for housing both the Royal College and the N.V.M.A.

In this connection the Secretary called the attention of the committee to the fact that the existing seven years' lease of 2, Verulam Buildings would expire in March, 1937. It was decided to consult the Association's solicitor as to the length of notice required to be given by the Association, and that the matter then be considered with a view to a further lease being arranged, but for a shorter period.

After hearing a further letter from the Hon. Secretary of the Scottish Branch, the committee approved the following recommendations to Council:

(*a*) That in addition to the grant of £5 per meeting with a maximum of £20 per annum already provided for, the Scottish Branch be allowed a further 5 guineas per year to meet extra office expenses.

(*b*) That with the object of promoting unanimity of action on the part of the branch and the N.V.M.A., the expenses of the Hon. Secretary of the Scottish Branch in attending meetings of the Council be defrayed by the Association.

With the same object in view, the committee also recommend that when the Standing Committees are being selected in future, consideration should be given to the advisability of the inclusion therein of the Hon. Secretary of the Scottish Branch.

It was understood from the branch Secretary's letter that copies of the N.V.M.A. Scheme for carrying out the recommendations of the Economic Advisory Council's Committee on Cattle Diseases had been sent by the Scottish Branch to various interested bodies in Scotland.

The committee resolved to recommend to the Council that the scheme be reprinted and circulated to members of the Association in the form of a supplement to *The Veterinary Record*.

Also arising from the minutes, the Secretary intimated that the number of unpaid subscriptions for the year 1935 had been reduced to seven. It was decided that the collection of six of these should now be placed in the hands of the Association's solicitor.

Proposed Amendment of Article 5.—As advised by Mr. Langley, the committee agreed to take counsel's opinion before proceeding with the proposed alteration of Article 5 in order to permit the payment of fees to members of Council for certain contributions to the journal of the Association at the same rate as is allowed to other contributors.

President-Elect.—With regard to the decision of the Council that there should be a President-Elect, the committee took the view that this did not affect the Articles of Association in any way. It was felt that the President-Elect should have no specified duties, but that the appointment should be intended merely as notice to the person concerned that he would be nominated for the Presidency in the following year and so prepare him for filling that office.

Veterinary Benevolent Societies.—Authority was given for payment of the annual subscription of 20 guineas to the Victoria Veterinary Benevolent Fund, and of a similar amount to the National Veterinary Benevolent and Mutual Defence Society in aid of its benevolent work.

Subscriptions to Other Bodies.—It was decided to continue the Association's membership of the National Horse Association and of the Parliamentary Science Committee, and the Hon. Treasurer was empowered to pay the subscriptions of 5 and 10 guineas, respectively, for the year 1936.

Libel Insurance.—The committee endorsed the action of the Chairman in authorising the renewal of the insurance against libel with Messrs. S. H. Cannon and Company, on the same conditions as before.

Financial Statement for January and Hon. Treasurer's Report.—The Hon. Treasurer's report, which showed a balance in hand on January 31st, of £2,632 7s. 3d., was approved and authority given for the discharge of liabilities amounting to £446 0s. 5d.

It was decided to invest the sum of £1,000 equally in War Loan 3½ per cent. and Australia 3¼ per cent., 1936/61. The Seal of the Association has to be affixed to the transfer in connection with the last-named Stock; the authority of the Council is therefore required for the sealing and signing of this document.

Members of Long Standing or in Partnership.—At the request of the Council, consideration was given to the desirability of provision being made to enable aged members of long standing to be retained on an honorary basis at the discretion of the Council. After discussion, it was decided to inform the Council that the committee does not recommend membership on any other honorary basis than that provided for in Article 19.

With regard to the suggestion that in the case of members in partnership the membership subscription to the Association be reduced, the committee decided to report that it found that this would not be practicable.

It was decided, however, to obtain the opinion of the Solicitor whether it would be possible to permit membership to newly-qualified veterinary surgeons for a period of one year at a reduced subscription, or whether this was prevented by the relevant Article of Association.

Consideration was also given to the following resolution submitted by the Lancashire Division and remitted by the Council:

> "That the question of how far grunting when unaccompanied by whistling or roaring, constitutes an unsoundness in the horse, be considered by a special committee of the National Veterinary Medical Association and their recommendations be brought to the Council of that Association."

The committee agreed to report to the Council that they did not support the formation of such a special committee inasmuch as it had come to their knowledge that the Agricultural Research Council was devoting funds to an investigation into the diseases of horses and they understood that grunting was one of the conditions which would be considered.

Royal Veterinary College.—Information was received by letter from the Chairman of the Board of Governors that in the new Charter applied for by the Royal Veterinary College provision is made for the appointment of four representatives of the N.V.M.A. on the Court of Governors of that College. The committee decided to seek the permission of the Council to deal with this matter when the time arrives for these representatives to be nominated.

Staff Salaries.—Following a discussion in private, the committee decided to recommend to the Council that the salaries of the General Secretary and the Editorial Representative be increased to £500 per annum, respectively, with the intimation that they consider that this should be the maximum salary attaching to these posts as at present organised.

Professor Wooldridge added that a special resolution was required giving authorisation of Council for the sealing and signing of the document for the transfer of stock mentioned in the financial statement.

The requisite resolution having been passed, Major Kirk said that the suggestion had been put forward that, with a view to increasing membership of the Association, the cost of membership to new graduates should be reduced, and he was wondering if it was a question that that Council should consider or whether it should go back to the committee, that a reduction should be made for partners in a firm.

Professor Wooldridge replied that the suggestion put forward by Major Kirk had already been referred to the committee, but, having considered the subject in all its bearings, it had come to the conclusion that it could not recommend a reduction for a second partner, but that they would consider a reduction for new graduates.

The report of the committee was then adopted, subject to the addition to the paragraph on staff salaries, after "respectively," of the words "such increase to be retrospective from the beginning of the year."

The Hon. Treasurer then presented his financial statement for the quarter, observing that the Association's sources of revenue were subscriptions of members, advertisement contracts and orders for *The Veterinary Record*. The number of members had now been raised to 1,803, and this additional source of revenue, together with an increase in advertisement contracts and sales, gave every indication that the year 1936, as regarded income, would be at least as satisfactory as last year.

The Council received this information with applause, and having approved the Hon. Treasurer's statement, heartily endorsed the President's observation that thanks were due to the Hon. Treasurer for presenting such an admirable balance-sheet to that meeting.

Editorial Committee

The report of this committee was read as follows by its Chairman (Major Kirk), who moved its reception and adoption, Captain Coleman seconding, and the motion being carried without discussion:—

Fortnightly meetings of this committee have been held during the past quarter.

At the first meeting it was agreed to insert free of charge a series of announcements concerning the published proceedings of the Twelfth International Veterinary Congress, to be supplied by Dr. J. R. Mohler.

It has been a matter of gratification to the committee that it is receiving for consideration an increasing number of interesting papers other than those presented at Divisional meetings. In consequence, almost for the first time the committee has a large amount of material in hand for the general article section. The committee has nevertheless deemed it desirable to endeavour to make permanent provision for a substantial reserve of "copy" and a sub-committee has placed certain suggestions before the committee in this regard, which will shortly receive consideration.

The interest of the "Notes and News" section has, it is believed, been materially increased by the devotion of far greater space than hitherto to the recording of veterinary evidence in legal cases.

The committee has reconsidered the decision previously arrived at that election addresses of candidates to Council, R.C.V.S., be accepted at advertisement rates, and it has now been resolved that "Election addresses be accepted for publication; that they be limited to 250 words, and that they be published in the correspondence columns of *The Veterinary Record*."

The committee has received, and accepted with much regret, the resignation of Major G. W. Dunkin, who has found himself unable to devote the requisite amount of time to its work. It is the unanimous recommendation of the committee that the vacancy created by the resignation of Major Dunkin be filled by the election of Mr. E. L. Taylor.

Report from the Provisional Committee for the Scarborough Congress

The next item was to receive a progress report from the Provisional Committee for the Annual Congress of the Association to be held at Scarborough, and this report, forwarded by Mr. E. F. McCleery, Hon. Local Secretary of

the committee, was read by the Secretary as follows:—

"I am pleased to be in a position to state that the work for the Congress is progressing in a most satisfactory manner. The Provisional and Executive Committees have met from time to time and considered various matters requiring attention, and at the same time visits have been made to Scarborough in order to inspect the public library buildings where the meetings and the exhibition will be held, and also to make various other arrangements.

"As regards the readers of papers and openers of discussions thereon, I am pleased to be able to state that these matters have now been definitely fixed. In the Public Health Section, Mr. J. S. Steward, F.R.C.V.S., D.V.S.M., has consented to act as opener of the discussion on Captain Torrance's paper. In the Experimental Pathology Section, Captain T. J. Bosworth, B.Sc., M.R.C.V.S., D.V.S.M., has undertaken to open the discussion on Professor Greig's paper. In the Veterinary Medicine and Surgery Section, it was hoped that Sir Arnold Theiler would be in England during the period of the Congress and would be available to act as opener of the discussion on Professor Mitchell's paper. Unfortunately, however, it has been ascertained that Sir Arnold will not be in England at that time and will therefore not be available for this purpose, but Major Brennan DeVine, of Birmingham, has consented to act in the capacity mentioned, whilst Major F. Chambers, O.B.E., F.R.C.V.S., of Wolverhampton, will open the discussion on Mr. Hewetson's paper entitled 'Hysteria in Dogs.'

"A very interesting item has been arranged under the heading of Operations and Demonstrations. Your committee have been fortunate in arranging for the attendance at the Congress of Professor Nils Lagerlof of the Stockholm Veterinary College, who has undertaken to give an address illustrated by lantern slides of his latest work in connection with sterility in bulls. In this connection, also, Mr. Downham, of the Harper Adams Agricultural College has kindly undertaken to arrange demonstrations of the methods used in the diagnosis, etc., of the principal diseases of poultry, whilst Mr. R. Hudson, of Retford, has undertaken to stage an operation, the subject of which is to be chosen at a later date.

"Invitations to be represented at the Congress have been issued to Government Departments and Local Authorities.

With regard to the social functions, after extensive enquiries the Royal Hotel has been chosen as headquarters and it is anticipated that all these will be held in that building. The hotel is at the present time being extensively altered and enlarged and your committee are satisfied that it is the most suitable place for the headquarters.

"Arrangements have been completed for the civic reception, President's reception, annual banquet, and Ladies' Guild dance to be held. As regards the guests to be invited to the banquet, your committee have this matter under consideration at the moment, and, in fact, letters of invitation have been despatched to many of the local celebrities, including Viscount Halifax, the Earl of Feversham, Lord Milton, Lord Middleton, etc., but to date no replies have been received. Your committee earnestly hope, however, that Viscount Halifax will be able to accept the invitation, and if so, they are hopeful of arranging a broadcast from the banqueting hall.

"No definite motor tours have as yet been fixed, but this matter is receiving the consideration of the committee.

"As regards Congress badges, specimens have been submitted for the consideration of the committee at its next meeting.

"Many other matters regarding demonstrations and minor details are under consideration, and your committee feel that the Congress should be in every way successful."

In reply to Mr. Steele Bodger, the General Secretary stated that he could give the Council the assurance that this year no invitations had been issued to members who had accepted banned appointments or to local authorities employing them.

Report from the Advisory Committee on Parasitic Diseases

In the absence of Major Duncan (Chairman of the committee), this report was read by the Secretary as follows:—

A meeting of the Advisory Committee on Parasitic Diseases was held at 2, Verulam Buildings, on Wednesday, February 5th, 1936.

Major A. C. Duncan occupied the chair, and Captain A. W. Noël Pillers, Mr. E. L. Taylor, and Colonel W. A. Wood were also present.

The minutes of the previous meeting were read and signed as correct.

Consideration was given to a revised draft which had been circulated by Mr. Taylor of the proposed article for *The Veterinary Record* describing the suggested method of counting worm eggs, and to a number of photographs illustrating the method.

After discussion, Mr. Taylor promised to modify the article and the photographs on lines suggested by the committee and then to circulate a final draft.

A similar arrangement was made in regard to a key for the identification of worm eggs and larvae submitted by Mr. Taylor with a view to publication at the same time as the article on the method of counting worm eggs. In connection with this key, Colonel Wood supplied drawings of the various species of eggs and these were handed over to Mr. Taylor.

It was agreed that both the article and the key should be passed to the Editorial Committee directly they had been approved by the Advisory Committee.

It was also the unanimous view of the committee that 500 reprints should be obtained in pamphlet form and that these should be placed on sale and a note to this effect inserted in *The Veterinary Record*. It was resolved to recommend to the Council accordingly.

Renewed consideration was given to a proposal that Table II of Mr. P. L. Le Roux's article on "Helminthiasis of Domestic Stock in the Union of South Africa," which appeared in the October, 1930, issue of *The Journal of the South African Veterinary Medical Association*, should be brought up-to-date and published in *The Veterinary Record*.

It was decided, however, to draw up a new Table altogether on the model of Le Roux's tables as a basis for this revised table. Captain Pillers then submitted a draft Table of Anthelmintic Medication for the Commoner Parasites of Equines, with the suggestion that this Table should be extended to the other forms of domesticated animals and then published in *The Veterinary Record*.

The committee accepted this suggestion, and it was arranged that Mr. Taylor should supply similar information in regard to Ruminants and Poultry, and Colonel Wood with respect to Pigs,

Dogs and Cats, for consideration at the next meeting.

As promised at the previous meeting, Captain Pillers presented a memorandum on Echinococcosis.

It was agreed that an effort should be made to obtain more information of the extent of this disease in animals and human beings, and with this end in view it was left to Captain Pillers to draw up a suggested form of enquiry, together with a list of members of the profession to whom it should be sent, and that further consideration be given to the matter at the next meeting.

Consideration was postponed of the suggestion put forward by Mr. Taylor at the November, 1935, meeting that the committee should prepare a series of reviews, for the information of practitioners, on Echinococcosis, Fascioliasis, Ascariasis of Swine and other parasitic diseases, these reviews to deal with the economic aspect of the diseases, their diagnosis, pathology and treatment.

No date was fixed for the next meeting of the committee, this being left to the discretion of the Chairman.

The report was received and adopted on the motion of Mr. Bywater, seconded by Major Rabagliati, and the thanks of the Council were accorded to the committee.

DALRYMPLE-CHAMPNEYS PRIZE

The President, speaking to this matter, said that he would be pleased to receive nominations for the 1936 award.

The Secretary stated that he had received, for handing to the President, three nominations.

The following committee was elected to examine and report upon the nominations received: the donor, the President, Dr. Bradley, Major Dalling and Professor Wooldridge.

MOTION BY MR. HALL MASHETER

The Council now considered the following motion on the agenda, standing in the name of Mr. J. W. Hall Masheter:—

> "That a Bill to promote the Department of Animal Health and to co-ordinate all the services recommended in the report of the Special Committee appointed by the N.V.M.A. which considered the report of the Cattle Diseases Committee of the Economic Advisory Council, and which framed proposals showing how the services of the veterinary profession could best be utilised in carrying out these recommendations, and which recommendations were unanimously adopted by the 'National,' be put in hand forthwith."

The President said that before that motion could be discussed it would require a seconder.

Mr. Steele Bodger seconded the motion for the purposes of discussion.

Mr. Hall Masheter, having been afforded the opportunity of speaking to his motion, then read a statement, as follows:—

"I am asking the 'National' to take the necessary action to promote a Bill to create a Department of Animal Health, for the purpose of co-ordinating the various services recommended in the report of the Special Committee appointed for that purpose by the N.V.M.A. It appears to me that the awakening of the 'National' to the necessity of implementing the Department of Animal Health is somewhat belated.

"A lot of time has been lost by trying methods not mentioned in the adopted report by way of deputations to this, that and the other body, without gaining any advantage, or bringing those bodies to the viewpoint of the report.

"As regards the county councils, these deputations have been particularly futile; in fact, they seem to have stimulated these bodies to greater activity in the matter of appointing whole-time services, and it cannot be denied that they have succeeded, to a great extent, in establishing the Department of Animal Health which this Association is pledged to establish.

"The list of whole-time officers in county and municipal services occupies ten pages of the 1936 Register of Veterinary Surgeons. There are 225 whole-time officers in 1936 as compared to 172 in 1935—a gain to county councils of 49 and to municipalities of four. The 147 county whole-time veterinary surgeons are actually or potentially displacing veterinary surgeons in agricultural practice. It is full time either that a Consolidating Order be made by the Minister or that a Bill to the same effect should be promoted by this Association. The need for this is obvious. At present these duties come under two Ministries, the county councils, municipal councils and the Milk Marketing Board. Is it too much to ask for the consolidation of all these duties, administered by so many authorities, into one national service?

"It is specifically stated in paragraph 6 of the report that, failing a separate Department of Animal Health, which I am convinced is impracticable, then the Department might be attached to either the Ministry of Agriculture or the Ministry of Health, but in no case should it be submerged in a subsidiary department.

"I submit that a county council is a subsidiary department and, as such, is 'out of bounds' so far as the agreed policy of this Association is concerned.

"Now let me draw your attention to paragraph 12 of the report, which, I again remind you, is the agreed opinion of this Association: 'There is little room for doubt that if the practitioner is not included in the "National" scheme, his cattle practice would soon diminish to such an extent that he would ultimately withdraw from the stock raising and dairying districts, a result which must inflict grievous injury upon the various sections of the agricultural community.'

"This I think is true, and agriculturists are becoming aware of that aspect. The county

branches of the N.F.U. are sympathetic to the claims of the general practitioner and have only to be approached to voice that sympathy.

"The general practitioner in agricultural practice is the only individual in the profession affected by the whole-time service of local authorities, and he must be protected.

"I suggest that the chief executive of the N.F.U. be asked to support the veterinary profession when the Bill for which I am asking is promoted. I have no doubt of the result.

"Another influential body, *viz.*, the Conservative Parliamentary Agricultural Committee, if properly approached, would also, I think, be sympathetic to the Bill. This committee consists of some 120 Members of Parliament and if their assent to the Bill was obtained the Bill would 'go through.'

"There is another thing in this respect which, in my opinion, this Association should do, and which, if it could be brought about, would be greatly to the advantage of the profession in its present straits, and that is, that the 'National' should endorse the opinion of the Council of Agriculture for England that the Ministry of Agriculture should be raised to the status of a First-class Department. That Council decided to ask the Prime Minister to give the proposal his sympathetic consideration. I propose that this should be done, because, in my opinion, the Department of Animal Health should be attached to the Ministry of Agriculture. It is only logical to assert that the Ministry of Agriculture is the natural habitat of all matters pertaining to animal health. It already has a well-organised Veterinary Department, co-ordinated for the work of its 'Attested Herds Scheme,' with experienced organisers allocated to its seven divisions. These seven divisions are again divided into 28 districts, and these districts, for the purpose of the Bill, could with advantage be extended.

"The rank and file, *i.e.*, the general practitioners, could without difficulty be attached to this framework.

"In this way all public health measures, in a veterinary sense, would be carried out uniformly. At the same time agricultural practice would be kept intact, agriculturists would retain the veterinary assistance they require, and the co-ordinated veterinary service would be in a position to proceed at once with any eradication scheme the Ministry of Agriculture may initiate.

"Agriculture and veterinary science are 'part and parcel' of each other, therefore it is obvious that this intimate relationship makes it imperative that the two sciences should work together for the wellbeing of both.

"It is wrong, in my opinion, that local rates should be made to pay for *national* schemes, and, if the Ministry of Agriculture is raised to the status of a First-class Department, then Exchequer grants would naturally be received by that Ministry and would, I hope, be expended fairly to the benefit of the many in our profession, and not only of the few, which is the policy of county councils.

"As to the Bill itself, I suggest that the summary attached to the report, as adopted, be the basis of the Bill (providing an Order is not forthcoming) and I further suggest that someone skilled in 'drafting' and conversant with 'Parliamentary procedure' be engaged to help the Special Committee, which I believe has not been dissolved, so that no loophole be left in the text of the Bill or in its method of presentation.

"I appreciate, and I want this Council to appreciate, that this motion will raise a political issue, if the phrase may be used in a restricted professional sense, which may later become a political issue in the normal sense—but the issue must be faced.

"I appeal to all general practitioners, whether they are in agricultural practice or not, and to all others who are in sympathy with general practitioners in agricultural practice—for they are the only individuals affected by this whole-time service—to support this motion. There is not a shadow of doubt that the man in agricultural practice, who is entirely dependent on this practice, is in for a very thin time when these whole-time appointments become universal. I look upon this report of the Special Committee as a pact—and a binding pact—on the part of this Association, to safeguard the interests of general practice against bureaucracy. It is the Magna Charta of the general practitioners in agricultural practice: there are about 1,000 of them—or one-quarter of the whole profession.

"I do not consider that it is necessary to answer any questions 'for or against' because everything required is set out in the report of the Special Committee, but if any elaboration of my remarks is necessary, the leading article published in *The Veterinary Record* following the adoption of the report, will supply it in full.

"I beg to move that this be referred to the appropriate committee for consideration."

The motion was referred to joint meetings of the Parliamentary and Public Health Committees for consideration, Mr. Hall Masheter to be invited to attend these meetings.

RESOLUTIONS FROM DIVISIONS

(1) **From the Southern Counties Division**

"That this Society stresses the importance of a closer co-operation being obtained in the future between the various branches of veterinary science; and in particular that the activities of veterinary investigation officers should be limited to that scope in which they would be of the greatest value

both to practitioners and to agriculture, and that any work carried out by them in the field must be with the consent of the private practitioner concerned."

The Secretary said that upon the receipt of that resolution he wrote to the Secretary of the Division asking whether the revised instructions under which the veterinary investigation officers were now working were known to the members who took part in the discussion at the meeting at which the resolution was passed. The Secretary stated that he had added: "It would appear from your letter that the methods employed in their work by veterinary investigation officers in the area of your Society have given cause for complaint. Should this assumption be correct, then may I suggest that you supply me with full details of what is objected to in order that the Association may consider the matter with a view to appropriate action being taken. I am afraid that it would be difficult for the Association to re-open the matter with the Ministry without more specific evidence as to how the instructions have been contravened or concrete proposals for the further revision of these regulations, as it is only a short while since the instructions were altered with the intention of ensuring the fullest co-operation between these officers and practitioners."

To that letter the Secretary of the Division had replied, on January 26th, as follows: "Many thanks for your letter of January 22nd, which I have brought to the notice of our President. As you surmise, one of our members did have a complaint against a veterinary investigation officer, but felt that it was not so much the fault of the individual as the system under which he worked that allowed him rather easily and without intention to come into conflict with the practitioner.

"I have spoken to the practitioner and he does not for the moment feel disposed to take the matter up and make a case of it, largely out of consideration for the veterinary investigation officer. What he feels, and it was shared by the remainder of those at the meeting, was that veterinary investigation officers were trying to combine the work of practitioner and that of pathologist. It was felt that more benefit would accrue if veterinary investigation officers were established in smaller areas, equipped with a laboratory, and be prepared to investigate material, as pathologists or bacteriologists, which would be brought them by the local practitioners.

"In these examinations cases would be under review by the practitioner in the field, and the pathologist in the laboratory, which would bring these men into much greater personal contact, when they would be called upon to share the difficulties of investigation.

"Such contact, we feel sure, would at one and the same time advance the work of disease investigation and go far to abolish the ill-feeling that at present exists between these two branches of the profession."

Mr. Male asked if that complaint was made before the new revision of the duties of the veterinary investigation officers, because they had been changed considerably, and if the provisions now in force were properly carried out there could be really no complaint about those officers: they had no excuse now for transgressing any of the rules of the profession.

Major Rabagliati observed that he felt that the Ministry of Agriculture having gone to very great lengths to endeavour to make a model working scheme for their veterinary investigation officers, it appeared to him that the time was not opportune to re-open the whole case now. He did not think, therefore, that that resolution should be supported at the moment: he would suggest that a reply should be sent that the Council did not consider the time opportune to re-open the question, but that they would be glad to be informed of any specific complaints.

Mr. Steele Bodger seconded.

The Secretary said that with the letter he wrote to the Secretary of the Division he sent a copy of the revised instructions; that complaint had arisen subsequently.

Dr. Wooldridge said that he understood that in that particular case, the details of which he happened to know about, there had been a very full explanation in open meeting between the veterinary investigation officer concerned and the veterinary practitioner, and that since that meeting the officers and the practitioners had been working extremely well together.

The President said that he was sure that the Council would be very pleased to hear that. (Applause.) Was it their wish that they should not accept the resolution from the Southern Counties Division, but await developments?

The Council expressed assent.

(2) **From the Society of Veterinary Practitioners**

"That a letter be sent to the chief veterinary officer in each county, having appointed such an officer, expressing the willingness of all the practitioners in that county to co-operate with, and work under the supervision of, the whole-time veterinary officers in the area."

"That the foregoing resolution also be sent to all county councils in whose areas the regional meetings of the Society were held."

Mr. Steele Bodger stated that at the meeting held in Oxford there was an addendum to that resolution, but owing to the fact that they had

considerable difficulty in getting a report from the reporter that addendum was not available for inclusion in the agenda that day. He would therefore crave the indulgence of the President to allow him to read the addendum and to permit it to be considered in conjunction with the principal resolution if he chose.

The President: "I see no reason why you should not, provided it will expedite the business." (Laughter.)

Mr. Steele Bodger said that this addendum was confirmed at the Council meeting of the Society of Veterinary Practitioners which was held immediately prior to that meeting; it should follow immediately after the resolutions and was as follows: "This meeting also considers that there should be a properly organised system of supervising and co-ordinating the work of not only the panel practitioner, but also the whole-time officer as recommended in the scheme put forward by the N.V.M.A."

The President stated that he thought that that introduced fresh material and that moreover it was not in the spirit of the original motion.

Mr. Steele Bodger replied that he begged to assure the President and the Council that the spirit of the addendum was exactly the same; nevertheless, he was perfectly willing that it should be left over to the next meeting.

The President: "I must ask you to hold that over to the next meeting of Council."

Professor Wooldridge asked if the Society of Veterinary Practitioners was in a position to speak for "all the practitioners in the county." Should not the words "all the" in the first paragraph of the resolution be omitted?

Mr. Male supported Professor Wooldridge's objection, and the Council agreed to the deletion of the words in question.

Mr. Bywater, referring to the second paragraph, asked if it was the intention to send the resolution even to those county veterinary officers who had accepted posts which had been banned by the Association.

Mr. Steele Bodger replied that when the Association decided what action should be taken in regard to assistant veterinary officers who were appointed to work with a chief veterinary officer who accepted a banned post, then the position would be clarified. If that argument were pursued, then logically all the junior veterinary officers who were appointed to a county working under such a chief veterinary officer should be expelled from the Association. He was quite willing that that question should be referred to the Appointments Committee for further consideration.

Mr. Tweed pointed out that according to the wording five county councils would get that resolution and the rest would not.

Mr. Steele Bodger replied that the practitioners attending the meetings in question were drawn from all the counties in those districts, and it was not intended that the distribution of the resolution should be restricted to the particular county in which the meeting was held.

Major Kirk expressed the hope that if that resolution went forward as from the "National" it would not be sent to the chief veterinary officers who occupied posts banned by the Association.

Mr. Margarson stated that the practitioners in Gloucestershire had been carrying on part-time inspection for ten years and they had been told by the Chairman of the Diseases of Animals Sub-committee, and indeed by the Chairman of the County Council itself, that they had been doing the work satisfactorily. But unfortunately the County Councils Association were so pushing in the matter of whole-time service that he was afraid that the chief veterinary officer was going to recommend that a whole-time assistant veterinary officer be appointed. He therefore thought that that resolution should go before the county councils.

The resolution was eventually amended to read:—

> "That a letter be sent to the chief veterinary officer in each county and county borough, having appointed such an officer, expressing the willingness of practitioners in that county or county borough to co-operate with, and work under the supervision of the whole-time veterinary officer in the area."
>
> "That the foregoing resolution also be sent to all county councils and county borough councils, except those employing officers who have accepted appointments banned by the N.V.M.A."

The resolution as amended was then adopted.

(3) From the Eastern Counties Division

> "The Eastern Counties Division requests the N.V.M.A. to take steps with the object of securing government control of the use of biological products and the limitation of their supply to those qualified to use them."

Mr. H. P. Standley, having been invited by the President to speak to this resolution, said that he thought that the resolution was one which was of vast importance to all members of the profession, particularly to those in private practice. All members of Council would be aware that at the present time large quantities of vaccines and sera were stocked by chemists and druggists and supplied to all and sundry to the great detriment of the members of the profession. If the Association could do anything to counteract that he thought that such action should be taken without delay. He hoped that the Council would give such assistance as they could to that measure.

Mr. Tudor Hughes, speaking in support, instanced the danger attendant upon the indiscriminate distribution of biological products to laymen by chemists and druggists. On one farm where he had recently gone to see a horse, he saw some black-leg aggressin about and ascertained that the farmer had purchased this material for the purpose of inoculating his lambs against black-leg, but he had had sold to him an antigen applicable solely to calves. As matters stood at present, therefore, there was a very grave danger when farmers could by this means be possessed of material highly dangerous to their stock.

Mr. Brayley Reynolds, also speaking in support of the resolution, instanced the supplying of a farmer with live abortion vaccine.

The President said that he would ask the Secretary to inform the Council what was the present state of legislation in this regard.

The Secretary stated that the situation in this connection had improved to some extent through the passing of the Diseases of Animals Act, 1935, towards the end of last year. Under this measure the Minister of Agriculture had power to make Orders for the regulation of the manufacture, sale and importation of certain biological substances capable of being used for veterinary purposes, and he understood that tuberculin was one of the substances which would be controlled under any Order which it was proposed to make under the Act of 1935.

Mr. Steele Bodger asked if tuberculin was the only substance that interested the veterinary profession that was likely to be included. If so, what steps could the Association take to secure the inclusion of other substances?

The President said that he thought that if the Council passed the resolution it would enable the Association to secure information for which members were asking.

Mr. Male observed that if the Minister of Agriculture had power to prohibit the sale of those therapeutic substances to laymen he would suggest that the Association should write to him pointing out the dangers and asking that the requisite measures for control and restriction should be put in force. That should not only apply to the products already mentioned; for example, millions of doses of swine erysipelas serum and vaccine were being distributed, especially throughout the eastern counties.

Dr. Wooldridge asked if it was not a fact that the medical authorities were faced with the same problem. It seemed to him unlikely that, until the legal position had been clarified in regard to the human subject, it would be clarified in regard to domestic animals: in that case, could they co-operate with the medical profession in regard to that matter?

Captain Simpson enquired if that resolution should not be referred to the Parliamentary Committee.

Professor Wooldridge asked if this was not a matter that could be referred in any way to the Parliamentary Science Committee.

The President: "It could be so referred to the Parliamentary Committee."

Sir Frederick Hobday commented that the chief difficulty confronting those who desired to improve the situation which gave rise to that resolution was that they could not stop chemists from supplying these substances. They had to try to get the law altered so that these materials —such as distemper vaccine—should not be supplied except by the veterinary surgeon or the medical man. The instance quoted by Mr. Tudor Hughes was an illustration of that: black-leg aggressins and vaccines presented a problem which was first brought up forty years ago, but then, as now, they had no power to stop the sale of these biological products by chemists.

Mr. T. Wilson commented that it was quite common for farmers to test their own cattle with tuberculin just prior to the official test and to weed out reactors in order that they might get their herds attested.

It was then agreed that the resolution should be referred to the Parliamentary Committee for consideration and report; and, on the proposition of Mr. Steele Bodger, seconded by Captain Dunlop Martin, it was further agreed that the General Secretary should write to the Minister of Agriculture and ask if it was proposed to introduce an Order—so that if there was any necessity, a special meeting of the committee might be called.

(4) **From the Scottish Branch**

> "The whole question of the representation of the Branches and Divisions on the Council of the National Veterinary Medical Association of Great Britain and Ireland should be considered with a view to reducing the size of the Council in order to promote more efficient working."

On the motion of Mr. Standley, seconded by Major Rabagliati, it was agreed to refer this resolution to the Finance and General Purposes Committee for consideration and report at the next meeting.

NEXT MEETING

It was agreed to hold the next meeting of Council, N.V.M.A., at Edinburgh, the date to be appointed by the General Secretary.

Professor Mitchell (amid applause) assured the Council of Dr. Bradley's willingness to accommodate the Council for this meeting at the Royal (Dick) Veterinary College, Edinburgh.

ANY OTHER BUSINESS

Under this heading, the Secretary informed the Council that one of the Association's representatives on the Parliamentary Science Committee, Dr. Wooldridge, had been elected as a member of the executive of that body.

The Council greeted this announcement with applause.

The proceedings concluded with the passing of a hearty vote of thanks to the President for his conduct in the chair.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

April 29th.—2 p.m., Meeting of Selection Committee in connection with award of "Dalrymple-Champneys" prize.

April 30th.—Meeting of the West of Scotland Division, N.V.M.A., at the George Hotel, Buchanan Street, Glasgow, at 3.30 p.m.

May 1st.—2 p.m., Meeting of Sub-committee of Organising Committee, N.V.M.A.

May 1st.—3.30 p.m., Meeting of N.V.M.A. Advisory Committee on Poultry Diseases.

May 2nd.—Meeting of the Society of Veterinary Practitioners at the Holborn Restaurant, Kingsway, W.C.1, at 2 p.m.

May 7th.—Meeting of the Central Division, N.V.M.A., at the Conway Hall, Red Lion Square, W.C.1, at 6.30 p.m.

May 7th.—Last day for nominations for election to R.C.V.S. Council.

May 8th.—Meeting of the Mid-West Division, N.V.M.A., at Bath.

May 8th.—2 p.m., Meeting of N.V.M.A. Special Salaries Sub-committee.

May 8th.—3.30 p.m., Meeting of Sub-committee *re* the Colonial Veterinary Service.

May 11th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

May 21st.—Voting Papers issued, R.C.V.S. Council Election.

May 28th.—R.C.V.S. Council Election Voting Papers due.

June 4th.—R.C.V.S. Annual Meeting and Luncheon in Edinburgh.

June 11th.—D.V.S.M. Examination begins.

June 24th.—R.C.V.S. Committee Meetings.

June 25th.—R.C.V.S. Committee Meetings.

June 26th.—R.C.V.S. Committee and Council Meetings.

June 29th.—R.C.V.S. Membership Examinations begin.

Sept. 14th-18th.—N.V.M.A. Annual Congress, Scarborough.

R.C.V.S. FELLOWSHIP

We are glad to note, from the report of the proceedings at the Quarterly Meeting of Council, R.C.V.S. (to be published in our next issue), that the Fellowship Diploma of the Royal College is to be awarded to Mr. Walter Downing. The subject of Mr. Downing's thesis was "The Life History of *Psoroptes communis* var. *ovis*, with particular reference to Latent or Suppressed Scab."

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ELECTION OF FELLOW, R.C.V.S.

R.C.V.S. Council Honours Professor J. D. Stewart

A further item of what we may term collateral business, which will give great pleasure to a large number of our readers—and in particular to the many resident in Australia—is recorded as follows: "On the proposition of the President, seconded by Dr. Share-Jones and supported by Dr. Bradley and Professor Wooldridge, it was unanimously resolved by the Examination Committee to recommend 'That the diploma of Fellow of the College be conferred on Professor James Douglas Stewart, B.V.Sc., M.R.C.V.S., Dean of the Faculty of Veterinary Science of the University of Sydney, in recognition of his eminent services to veterinary science.'"

It will be remembered that on the occasion of the celebration of the Silver Jubilee of the University of Sydney Faculties of Agriculture and Veterinary Science on August 26th, 1935, Professor James Douglas Stewart's completion of 25 years' service in the Chair of Veterinary Science was also celebrated. Professor Stewart was appointed to the newly-established Chair of Veterinary Science in 1909 and has occupied that position until the present day, guiding the school through its early infancy to its present flourishing manhood, when the value of the services of the veterinarian has assured its successful continuance.

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PERSONAL

Appointment.—Captain R. D. Mackintosh, M.R.C.V.S., B.V.Sc., (Tor.), Ardersier, Inverness-shire, has been appointed veterinary officer for Insch and district area of Aberdeenshire in succession to Mr. Macfarlane, retired.

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Marriage.—Edwards—Blackwood. On March 19th, 1936, at the Glasgow University Memorial Chapel, Mr. Samuel John Edwards, B.Sc., M.R.C.V.S., veterinary pathologist to the Hannah Dairy Research Institute, Kirkhill, Ayr, to Miss Janet H. Blackwood, B.Sc., Ph.D., biochemist to the Institute.

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Retirement.—Mr. James Murray, Banchory, the oldest living practising veterinary surgeon in Scotland, who has followed his profession as a veterinary surgeon on Deeside for fifty-six years, is soon to retire. He was appointed by the

Upper Deeside Agricultural Society as their veterinary surgeon out of a short leet of fifteen in 1880.

Mr. Murray has been qualified for sixty-one years and has practised in Caithness, Yorkshire, Brighouse, and Huddersfield.

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R.C.V.S. OBITUARY

Gardner, William Boyd, Ballymena, Co. Antrim, N. Ireland. Graduated Glasgow, May 24th, 1888; died April 14th, 1936.

Hunt, Francis Dillon (Toby), o.b.e., Lieut.-Colonel, r.a.v.c. (retd.), Curragh Bridge, Fleet, Hants. Graduated London, December 16th, 1890; died April 13th, 1936.

Malone, William, Slaney Street, Wexford. Graduated New Edinburgh, May 24th, 1894; died April 15th, 1936.

O'Neill, Henry Joseph, 5, Oakfield Road, Ilford, Essex. Graduated London, December 14th, 1897; died April 12th, 1936, aged 75 years.

Race, Harry, 40, Finch Road, Douglas, Isle of Man. Graduated New Edinburgh, July 21st, 1887; died April 13th, 1936, aged 69 years.

Tennant, Robert Craig, Bell Farm, Clewer Hill, Windsor, Berks. Graduated London June 27th, 1888; Fellow, December 10th, 1898; died April 15th, 1936, aged 71 years.

Mr. Wm. Boyd Gardner

The death of Mr. Wm. Boyd Gardner, m.r.c.v.s., which occurred in the Waveney Hospital, will evoke widespread sorrow in Ballymena and throughout the North as well as in the South of Ireland.

Mr. Gardner, who was in the late sixties, and who was an active member of the veterinary societies in Ireland, also a member of the N.V.M.A. of long standing, was a son of the late Mr. Samuel Gardner, of Kirkinriola, near Ballymena. He was for a long time a leading veterinary surgeon in the South of Ireland. While in residence in Dublin he was the chief representative of the veterinary surgeons associated with the Dublin Horse Show. For a time Mr. Gardner practised in the North of England, but later settled down in Drogheda, where he carried on practice for a quarter of a century. About twelve years ago he returned to his native Ballymena and practised successfully. He was a member of First Ballymena Presbyterian Church.

He was unmarried, but leaves a brother and sister and other relatives to mourn his loss.

Lieut.-Colonel Hunt

Lieut.-Colonel F. D. Hunt, whose death it is our sad duty to record this week, was one of the most popular men in the R.A.V.C., becoming known especially for his interest in racing and as Stipendary Steward to the Bombay Turf Club for several years after retirement from the Corps. "Toby" Hunt, as he was affectionately called, was, indeed, one of the best-known figures in India, where his knowledge of horse-racing and its organisation as a means of popular entertainment and his unimpeachable integrity brought him universal affection and esteem.

We hope to be in a position in our next issue to print an appreciation of Lieut.-Colonel Hunt from a late colleague in the R.A.V.C.

Major Tennant, m.v.o., f.r.c.v.s.

The King Represented at the Interment

With the death of Major R. C. Tennant, who held appointment as Honorary Veterinary Surgeon to His Majesty the King, which we record above with great regret, there passes an esteemed personality who made his life in unobtrusive ways of very real value to his profession, not only allying himself usefully with one of its most important organisations—the Royal Counties Division, N.V.M.A.—but always showing a real eagerness to assist younger men from the rich store of his experience.

Major Tennant's nature was a very unassuming one, and it is characteristic of him that he was greatly impressed by the simplicity of the ceremony at which he was invested with the M.V.O.: apparently he had quite a long and informal chat on that occasion with His late Majesty at Windsor. As our readers will be aware, Major Tennant had charge of the famous Hanover cream horses which Queen Victoria introduced to the Royal Stables at Windsor and which were later used to draw the Coronation carriages of King Edward VII and King George V. He also attended the famous Windsor greys and examined them before last year's Silver Jubilee Drive. Major Tennant was veterinary surgeon to the Royal farms at Windsor during three reigns. He had just sold his practice to Mr. Paterson prior to the death of King George.

Going to Windsor nearly fifty years ago, Major Tennant in his younger days was a very successful amateur rider. He held office as veterinary surgeon at Ascot, Windsor, Hawthorn Hill, and other race meetings, and acted as steward on occasion at National Hunt meetings. Well known in hunting circles, he rode with the Garth, also with the Berks. and Bucks. Staghounds, till shortly before his death officiating as veterinary surgeon to these two packs.

The late Major Tennant was President of the Royal Counties V.M.A., in 1908, and it was in July, 1929, that the Association became deeply indebted to him for his help in arranging a memorable meeting—a visit to the Royal mews and farms at Windsor—which our account at the time shows to have been one of the most successful gatherings ever held by this old-established veterinary association. Major Tennant continued as a regular attender at the meetings down to the time of his death.

A daughter and two sons, to whom we extend our sincere sympathy, are left to mourn his loss, one of the latter being in India with the R.A.V.C.

Captain Humphrey Lloyd (Gentleman Usher to the King (represented His Majesty at the funeral service which took place at Clewer Church on Saturday, prior to the removal of the remains to Woking for cremation. The service was conducted by the Rev. J. R. Simpson.

The mourners included:—

Mr. P. R. C. Tennant (son), Miss Tennant (daughter), Mrs. N. Trydell (sister), Miss Norah Trydell (niece), Mr. C. W. J. Tennant (brother), Major-General Watson (brother-in-law), Mr. Douglas Tennant (nephew), Miss Tremayne (niece), Mr Charles Craig (cousin), and Mrs. Craig, Miss Jessie Tennant (cousin), Miss Mildred Tennant (cousin), Mrs. J. de V. Bowles (cousin), and Colonel Bowles, Major and Mrs. Kelly, Mrs. King, Miss King.

Captain and Mrs. Walter Legge, Miss Hanbury Williams, Vety.-Colonel Rees-Mogg, Lieut.-Colonel B. R. Body, Major Bourne May, Major G. D. Edwards, Mrs. Golding, Miss D. Shipley, Mrs. John Marsh, Mr. E. C. Durant, Mr. Sidney Buckland, Mr. E. P. Cross, Mrs. Parnell, Mr. T. Maher, Mr. Charles Frail, Mr. C. H. T. Stovell, Mr. J. A. Dandridge, Mr. C. P. Waters (superintendent of the Royal Mews, Windsor), Mr. R. H. Palmer, Mr. W. E. Mason, Mr. H. G. Simpson, Mr. R. A. C. Simmonds (representing Major E. W. Shackle and the Berks. and Bucks. Staghounds) Mr. W. Bulteel, Mr. J. Webb, Inspector O'Carroll (representing the R.S.P.C.A.), and the

following representing the Royal Counties Veterinary Medical Association: Mr. R. A. Willett, (for Mr. F. W. Willett), Mr. Norman Male (for Mr. G. P. Male), Mr. E. S. Paterson, Mr. H. Bell, and Mr. J. Bell.

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GENERAL OBITUARY

Dr. Naoshi Nitta

We learn with great regret of the death of Dr. Naoshi Nitta, which is announced in the March number of the *Journal of the Japanese Society of Veterinary Science*. Dr. Nitta was co-Editor of the Journal, and one of the most eminent members of the profession in Japan. He was made an honorary associate of the Royal College of Veterinary Surgeons in 1930 at the time of the Eleventh International Veterinary Congress in London. We extend to our Japanese colleagues our respectful sympathy in the loss which they have suffered by the death of so eminent a veterinary scientist.

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Mr. William Greig: an Apostle of Horse Haulage

Under the above heading, *The North British Agriculturist* records that a great pillar of the interests of horse breeders passed away recently in the person of Mr. William Greig, formerly superintendent of Glasgow Corporation Cleansing Department. It was under his regime that Glasgow Corporation's geldings became famous, while he conducted the investigation into the costs of horse *v.* mechanical transport which showed a saving of 1s. 6⅝d. per ton in favour of the horse. Thus Mr. Greig exploded the theory that mechanical transport was the last word in effecting economies on the streets, as a result of which the horse almost was reinstated in the former esteem in which it was held. "Still one thinks that the practical application of the facts illustrated by the Greig figures have considerable room for expansion," adds "Horseman" in the journal mentioned. "A full realisation of horse haulage economies, for special classes of transport, in certain urban areas, has yet to take place. That applies to the use of horses of all the various weights. There are the special respective niches for the Clydesdale, the Highland pony, and the Shetlander. In many cases motor transport is used (as a piece of costly snobbery), where there is no call for it and either the farmer producer on the one hand, or the consumer on the other, foots the extra bill for this useless finesse in selling foodstuffs at the consumers' door."

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Mrs. Elizabeth Harvey

We regret to learn, from a Reuter message, that Mrs. Elizabeth Harvey, aged 31, and her husband, Mr. Frederick Harvey, a director of Transcontinental and Western Air Inc., were killed in an air accident in Pennsylvania on Sunday night, two days after the former had arrived from England. Mrs. Harvey was a daughter of the late Lieut.-Colonel F. B. Drage, Royal Army Veterinary Corps, who was attached to the Life Guards for many years, and she had just returned to the United States from a holiday at Somerby Grove, Leicestershire, with her brother, Mr. Charles Drage, a member of the Quorn Hunt.

PRECURSORS OF MILK CONSTITUENTS FOUND IN THE CIRCULATING BLOOD

We reproduce below abstracts issued by the Royal Society of the following papers, on certain aspects of the above subject, read before the Society on February 27th, 1936:

W. R. Graham, junior, H. D. Kay and N. R. McIntosh—I—A convenient method for obtaining bovine arterial blood. W. R. Graham, junior, T. S. G. Jones and H. D. Kay—II—The precursors in cow's blood of milk fat and other milk constituents. S. J. Folley and P. White—III—The effect of thyroxine on milk secretion and on some blood constituents of the lactating cow. Communicated by H. S. Raper, F.R.S.

The processes taking place in the mammary gland during milk secretion in the dairy cow have hitherto been difficult to investigate because no satisfactory method has been known for obtaining arterial blood without serious disturbance to the animal. Such a method has now been devised, and consists in puncture of the internal iliac artery through the wall of the rectum. The method is relatively safe and over 150 arterial punctures have been made with only one fatal casualty.

Certain details of technique must be adhered to if reliable data on the precursors of the milk constituents are to be obtained. With this method, using the necessary precautions, the following findings have been made: (*i*) the fat of cow's milk is derived in the main from the non-phospholipin fatty acids of the blood, *i.e.*, probably from those of the neutral triglycerides of the blood plasma; (*ii*) the phosphorus compounds of the milk (including casein, phosphoric esters, and the mineral phosphate) derive their phosphorus from the *inorganic* phosphate of the blood plasma, and not from the phosphoric esters or the phospholipins of the blood; (*iii*) relatively large quantities (up to 30 per cent.) of the blood sugar are removed from the blood on passage through the mammary gland, the amount of sugar taken out of unit volume of blood being related to the level of sugar in the arterial blood and (probably) to the volume of milk secreted; (*iv*) the number of volumes of blood required to produce one volume of milk is of the same order whether calculated from the fatty acid changes, inorganic phosphate changes, or sugar changes between arterial and venous blood. A rapid circulation of blood—probably at the rate of 300-400 volumes for each volume of milk secreted—takes place through the mammary tissue.

There is a suggestion that one of the factors controlling the quantity and quality of the milk secreted is the arterial blood sugar level. This can be raised and kept above the normal level in the cow by thyroid feeding or thyroxin administration. The effect of thyroxin administration on the volume and quality of milk secreted by the cow has been carefully examined and the results subjected to statistical treatment. Under proper conditions a considerable increase in milk volume and in milk fat percentage and also in the percentage of non-fatty solids in the milk occurs. After cessation of thyroxin treatment, the rate of milk secretion rapidly falls and may go below the normal rate that would be expected from the slope of the lactation curve. Thyroxin treatment does not, however, prevent the normal process of the diminution of functional activity of the mammary gland (which normally takes place after the peak of the lactation cycle): the "thyroxin curve" is parallel with the "normal" one but at a considerably higher level.

The phosphatase content of the milk (but not

of the blood plasma) of the thyroxin-treated animals shows a striking decrease, which is more than restored when thyroxin administration is stopped. The phosphatase of the milk is not derived directly from that of the blood.

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VETERINARY INSPECTION IN SOMERSET

The recommendations foreshadowed in our issue of March 28th with regard to the extension of whole-time veterinary service in Somersetshire were duly put forward and approved at the last meeting of the County Council. These recommendations, states *The Milk Trade Gazette*, were eventually presented in the report of a joint conference of members of the Diseases of Animals (Executive) Sub-Committee and the Milk Special Committee of the Council on the question as to whether any alteration should be made in the county veterinary service.

The County Council, it was stated, now have a whole-time veterinary officer who, with the assistance of a panel of 28 part-time veterinary inspectors, private practitioners paid by fees, carries out the duties under the Diseases of Animals Acts and Orders and under the Milk Order of 1923 in connection with Grade A licences.

In order that their policy of assisting in extending the production of graded milk in the county and encouraging all milk producers to clear their herds of tuberculosis might be carried into practical effect the conference recommended the Council Council: To carry out, through their whole-time and part-time veterinary staff, all veterinary examinations of Grade A or Accredited herds, payment for this service being made to the Council by the producers on the following scale of charges: For herds of not exceeding ten cows, 3d. per quarter per cow; for herds exceeding ten cows, 4½d. per quarter per cow.

To carry out all veterinary examinations and tuberculin tests of tuberculin tested herds, payment being made by the producers as follows: 1s. 6d. per half-year for every animal in the herd.

To give general advice, including tuberculin testing, to any milk producer in the county desiring to rid his herd of tuberculosis and willing to take such action as the county veterinary officer may suggest. To authorise the appointment of a whole-time assistant county veterinary officer, at a commencing salary of £500 per annum, rising to £650 per annum, together with travelling expenses.

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Corrigenda.—Sir John McFadyean's Diamond Jubilee of Graduation as M.R.C.V.S.: p. 503, col. 2, 19 lines from foot *for* "41 years later" *read* "31 years later."

Mr. T. Bowett, of Worksop, writes: "*Re* the Veterinary Practitioners' Meeting at Peterborough, a report of which appeared in *The Veterinary Record* of April 11th and with reference to question 3, may I ask you to state that the particular question was not asked by me? I was in sympathy neither with the question nor with the reply."

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THE FUTURE OF PRIVATE PRACTICE

Cheshire Farmers and the County Council Scheme

Cheshire County Executive of the National Farmers' Union, at Chester, recently discussed the position arising from what the members consider to be a dearth of private veterinary surgeons in the county. This, it is said, has come about following the appointment by the County Council of a staff of full-time veterinary officers.

Many of the younger men, said the chairman, were not attracted by private practice. After qualifying and gaining some practical experience, the majority sought positions under county authorities. Farmers, consequently, found it difficult to obtain the services of private veterinary surgeons.

Mr. W. H. Hobson (Nantwich) said the matter was causing farmers much concern. He knew of instances where farmers had had the utmost difficulty in finding a veterinary surgeon to attend serious cases.

Mr. J. Barnett (Nantwich) said that the county branch supported the County Council's scheme of appointing a chief veterinary surgeon and five district officers, but now they had eleven officers—and he understood the County Council was going to ask for more. Where were they going to stop? Two veterinary surgeons had gone from Nantwich in the last two years, and they had not been replaced.

Mr. T. C. Goodwin said that, from a business point of view, the County Council's plan was the cheaper one, and it had to be remembered that additional legislation had recently been imposed on the County Council, with the result that it had been obliged to increase its veterinary staff. When they considered the work that the veterinary staff did under the Tuberculosis Order they could not complain about the cost of the service, or about the numbers employed. He did not think the employment of full-time veterinary officers would lead to a decline of private practitioners. In any case, they could not defend private interests against public interests.

At the chairman's invitation, Mr. Kerr, chief veterinary officer of Cheshire County Council, addressed the meeting and expressed the opinion that there was still plenty of room for the private practitioner operating the larger and better kind of practice. Full-time veterinary officers did not claim to be cleverer than private practitioners, but they had far more time to deal with tedious details.

Mr. Kerr was thanked for his address.

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LEGAL NOTES

"Over-stocking" of the Udder.—Giving evidence in a case at the Swindon Borough Police Court, in which, prosecuted at the instance of the R.S.P.C.A., a Shrivenham farmer was fined £4 and costs for causing unnecessary suffering to a cow by unreasonably allowing the animal to become overstocked with milk, Mr. J. C. Coleman, M.R.C.V.S., of Swindon said: "I cannot conceive a more painful condition than the overstocking of a cow's udder with milk, especially so when it is brought into contact with its calf. Naturally, then the cow gives down her milk for the calf, but being bustled round the ring in a market it has no chance of relieving its pain by suckling the calf. It is a general practice, but in my opinion it is a cruelty that should be stopped."

Inspector Mullard said he saw the cow in a pen at Swindon Market. She was uneasy, her back was arched, and hind legs straddled, and her head was down. She was obviously in great pain, and he could see that she was badly overstocked with milk.

When he saw the defendant, the latter said that the cow had her calf only the previous Thursday, adding, "All that is wrong with her is that she wants her calf. She was practically milked out this morning, and if you were to milk her dry now, she would still have the same big udder"; also, that "it would not do for him to send a 'wrong' cow to any market as he sent large numbers to several markets."

Continuing his evidence, the Inspector said that the calf did not appear to have any milk that morning. Its stomach was empty. The cow was sold, and the calf was put to it, but its teats were so sore that it would scarcely allow the calf to feed. The uneasiness disappeared when the cow had fed the calf.

The Clerk: Does it improve the selling value of a cow if it has a well-stocked udder?

Inspector Mullard: That is the general opinion.

Answering Mr. Francis Walsh, for the defendant, Inspector Mullard agreed it was "probably true" that there would not be a good chance of selling a cow with an empty bag. He did not agree that the condition of the cow was due to "padding" (a natural condition occurring during calving and lactation periods).

Mr. Walsh: Isn't it common to see a cow with its back arched after calving?

Inspector Mullard: A day after, but not four days after.

Mr. J. C. Coleman said the cow was a hard milker. The udder was exceedingly tense: it was not a good shape, but this was very much exaggerated due to the teats being drawn outwards because of the overstocking. It evinced great pain and there was no "padding" of the udder. "I should not think this cow had been milked since Saturday morning," he concluded.

Asked by Mr. Walsh what he would say if he were told the cow was milked right out on Sunday, and a gallon and a half taken from it on Monday, Mr. Coleman replied, "I should not believe it."

Mr. Walsh said the defence was that the condition of the cow was due to "padding" of the udder and not to overstocking.

Defendant said the cow was milked out on Sunday morning, but in spite of this she still appeared as if her bag were full. She was naturally an arch-backed cow, and he could see no difference in her when the Inspector drew his attention to her.

Thomas Luker, the cowman, gave evidence as to the amount of milk taken from the cow on the Sunday and on the Monday morning. Her usual daily yield was about three to three and a half gallons.

Mr. T. A. R. Filgate, veterinary surgeon, of Faringdon, said it was extremely difficult to tell the difference between "padding" and overstocking.

Sheep Neglect Case.—Giving evidence in a case recently heard by the Barnsley West Riding magistrates in which the R.S.P.C.A. were the prosecutors of Gilbert Roberts, farmer and butcher, of Holmfirth, for causing cruelty to sheep on Wharncliffe Chase, Mr. S. E. Sampson, veterinary surgeon, of Sheffield, said he examined four sheep in the buildings at Wharncliffe Farm. They were very small animals and in a poor emaciated condition. One was so small that he could pick it up with his thumb and finger. He ordered two of them to be killed at once. Later he saw 39 sheep in the cart shed, all of which were in a bad condition, some having pulled off their wool; one of these also had to be slaughtered immediately. He made a *post-mortem* examination on the three carcases which were very much emaciated, the carcases weighing 16, 22, and 32 pounds respectively, normally they should have weighed from 40 to 60 pounds. He could see through their ribs, and they appeared to have suffered considerably. He went into the field where the sheep had been kept, and the only herbage for them to eat was a few rushes sticking out from under the snow. He found no food in the stomachs of the sheep, and in his opinion the animals had been kept without food. He found no organic disease.

Mr. D. S. Rabagliati, Chief Veterinary Officer, West Riding County Council, said he visited Wharncliffe Chase on Tuesday, March 3rd, and examined the sheep, as the animals were suspected to be suffering from sheep scab. He saw the three sheep which had been slaughtered on Mr. Sampson's advice, and he also examined the sheep in a cart shed, but there was no evidence of scab. They were the thinnest sheep he had ever seen in his life, and he could pick them up with the greatest of ease.

A police witness said he saw one sheep at the Chase Lodge entrance, and in a field close to the crags he saw a further number of sheep. The sheep were driven into a corner of the field and 34 were counted, most of them being last season's lambs and ewes. While the sheep were being driven two of them fell and had to be carried, and when picked up they were nothing more than wool and bones. The field was covered with 18 inches of snow and there was no food of any description, while a search revealed the carcases of three dead sheep in the snow.

A sub-land agent at the estate office, Wharncliffe Estate, said that he had asked Roberts to remove the sheep, but he had heard nothing from him, and he placed the matter in the hands of the Earl's solicitors. When the agreement was first made that the defendant's sheep could graze on the Chase it was understood that they were to be removed during the winter.

Defendant's solicitor said that the prosecution must prove that Roberts knew of the cruelty, a matter in which they had failed. It was hard to conceive that a man who was losing financially would do such a thing deliberately. There was no doubt that the sheep had suffered, but it was not through any fault of the defendant. There was no snow when he removed them from the Chase into the field, but snow did come later, and that prevented him from removing the sheep. He submitted that the sheep did not die from lack of food, but through exposure.

The Chairman (Colonel C. Hodgkinson) said it was a very bad case, and the Bench had been considering whether to send Roberts to prison. The fact that there had been some snow made it all the more imperative that Roberts should have attended to the sheep. For such an offence he was liable to three months' imprisonment, but he would be fined £25 with £17 16s. 0d. costs.

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THE NEW ZEALAND EMBARGO ON BRITISH LIVESTOCK

"Strong efforts are being renewed to induce New Zealand to lift her eleven-year-old embargo on British livestock," writes a Special Correspondent of *The Sunday Times*. "The president of the Royal Agricultural Society has sent a protest to the New Zealand Government through the High Commissioner and this is to be followed by a friendly appeal from the president of the

National Farmers' Union to the president of the New Zealand Farmers' Union, who are in favour of maintaining the ban.

"Lord Bledisloe, former Governor-General of the Dominion, said recently that it was 'an unreasoning dread of foot-and-mouth disease which led to the embargo, with a consequent steady deterioration (in New Zealand) of most kinds of farm animals.'

"New Zealand is the only country in the world enforcing an absolute embargo of the kind, even though the animals have passed through the London Quarantine Station at East India Dock. This station was opened in April, 1928, with the very object of making embargoes unnecessary. There has never been a complaint from any importing country, and of the 3,500 animals that have passed through not one has developed foot-and-mouth or other infectious disease. Since April, 1934, this station has been directly controlled by the Ministry of Agriculture, and quarantine conditions are now so rigid that veterinary authorities consider it impossible for any serious infective disease to remain undetected.

"Live stock of all kinds were exported to New Zealand for half a century without a case of foot-and-mouth disease ever occurring, and with the elaborate precautions taken in the light of present-day knowledge it is contended that risks are now infinitesimal and fears groundless. Indeed, this claim is supported by a New Zealand Government statement in which it was mentioned that the Government's technical advisers consider it perfectly safe to import stock from Great Britain. Almost all the produce of New Zealand, except wool, is consumed in Great Britain, and British stock breeders feel that the long-continued ban is depriving their industry of valuable custom. Recently at least £10,000 worth of stock was landed in the Dominion from the United States and Canada."

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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A DIAMOND JUBILEE OF GRADUATION

From Sir John M'Fadyean.

To the Editor of The Veterinary Record

Sir,—I trust that you will grant me space in the *Veterinary Record* to express my warmest thanks for the very kind congratulations offered in your last issue on the sixtieth anniversary of my admission as a member of the Royal College of Veterinary Surgeons.

The object of work, of course, is not to earn praise, but it would be a poor heart that would not rejoice to receive such testimony of friendship, sympathy, and good wishes from those to whom one's work is best known.

I hope it will not be considered a fault when I confess that I had not realised that Monday last was my Jubilee until I opened the *Veterinary Record* and saw my portrait in it.

I do not pause to consider whether I have fully deserved all the kind things that have been said about me, but I do wish the readers of the *Veterinary Record* to know that the article in question afforded me great pleasure.

I have never ceased to consider myself fortunate in the choice of a profession. The appreciation and encouragement which I have always received have been an added incentive to work.

Yours very truly,
J. M'Fadyean.

Highlands House,
Leatherhead.

April 22nd, 1936.

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"THOUGHTS ON THE AUSCULTATION OF THE BOVINE CHEST."

To the Editor of The Veterinary Record

Sir,—May I be allowed to comment on the "Thoughts on the Auscultation of the Bovine Chest," by Mr. H. L. Torrance, published in your last issue?

Regarding traumatic pneumonia, Mr. Torrance says that the reticulum is applied to the diaphragm on the lower right posterior side and consequently the right lung is as a rule first affected and more extensively so. Now, is this the general rule? From *post-mortem* examinations I have gained the impression that the reticulum is usually more to the left, if anything. I see that Sisson says that it is situated in the median line, more or less, and yet in his figures it shows more on the left.

In my experience it is commonly the left lung that first reveals the effect and is usually more affected than the right, though I certainly have met cases where the right lung seems to have been affected first and also more seriously.

In the last stages of chronic traumatic pericarditis as a rule both lungs are equally affected, from what I have seen of them.

My biggest difficulty is in the diagnosis of tuberculous pleurisy when the pleura adheres and there is practically no fluid present. Admittedly, one does not often find tuberculous pleurisy without involvement of the lung substance—which gives one sufficient guidance. Of course, lung sounds are usually dulled, but how can one be sure that one is dealing with tuberculous pleurisy?

Yours truly,
A. J. Baxter.

Sherborne Street,
Lechlade,
Gloucester.

April 19th, 1936.

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PROFESSIONAL TRAINING IN THE HUSBANDRY AND DISEASES OF FUR-BEARING ANIMALS AND OF BIRDS

To the Editor of The Veterinary Record

Sir,—I am sorry to see that Dr. Hare's remarks on the lack of education on the diseases of feathered and furred animals did not meet with the

approval of some of his critics. It is a subject that should be treated as most would a game—in a sportsman-like manner, as did the President of the R.C.V.S. Most, if not all of us, are aware what Dr. Bradley has done to advance instruction in the diseases of poultry and in being the pioneer in the teaching of Zootechny, which has been so long ignored in the training of the veterinary student in this country. There is no doubt that Dr. Hare being a comparatively young man and taking a great interest in the profession, would like to see it attain that position which it should occupy in the realms of science and in practice. The advance of our knowledge concerning the economic animals and those of only sentimental value would not only benefit the practitioner but also cater for the requirements of the general public and thus obtain for us a higher position in the social world.

With the exception of Sir John M'Fadyean, nobody seems to have taken any scientific interest in the diseases of poultry, game, and other small animals until 15 or 16 years ago when the late Sir Stewart Stockman got the Ministry of Agriculture and Fisheries to establish a Research Institute at New Haw, Weybridge, and appoint veterinary surgeons to specialise in the elucidation of those diseases. Since then a greater interest has been very slowly taken by other institutions: in some cases, the researchers have not been members of the veterinary profession. Unless we are prepared to cater more for poultry, rabbits, game, fur animals, luxury animals, etc., we cannot complain if men outside our profession usurp our function as many are now doing.

People are more likely to spend a greater amount on their pleasures than on their necessities, as the economic animals are. In reality, we should follow the example of most other countries where they have special institutes in which veterinary surgeons can investigate the diseases of every animal species, such as poultry, fur animals, game, fishes and bees.

I am of opinion that veterinary colleges could give the practitioner the post-graduate instruction requisite to enable any of those who desired it to become specialists in the diseases of these small animals. When we take into account the fact that many of the furred animal species are of greater individual value than most of the horses, cattle, sheep, and pigs, then is it not up to us to cater for their owners? Look at the fur industry and see the great value of pelts which go to clothe rich people! The industry is rapidly increasing not only in this country but also in every other large State. The Bureau of Biological Survey, Department of Agriculture, Washington, D.C., U.S.A., cater for the breeders of such animals and give employment to many veterinary surgeons to investigate and control their maladies. Moreover, it supplies useful literature on the diseases to the owners of such animals—even cage-birds—who may demand it. Some might say, "What have the diseases of grouse and other feathered and the furred game and the diseases of fishes and bees to do with veterinary surgeons? I might answer, "Why have they, for the past 50 or 60 years, been taken up by medical men and other scientists?"

The Royal College of Veterinary Surgeons have taken the trouble to grant the D.V.S.M. and the D.T.V.M. and H. and therefore I do not see any reason against their granting other specialist diplomas. The medical profession have their special diplomas not only in Public Health but also in Ophthalmology, Obstetrics, Midwifery, Radiology, etc.

If there were a special diploma in medicine of the furred and feathered animals, fishes and bees, I believe it would be an inducement for women and some men to take it up and perhaps for the Ministry of Agriculture and Fisheries and other bodies to employ those holding such a diploma to do the work for which they were specially qualified. I see no difficulty in the way.

Yours faithfully,
Henry Gray.

Kensington.
April 18th, 1936.

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THE VOLUNTARY SCHEME FOR THE FOUNDATION OF TUBERCLE-FREE HERDS IN CO. DURHAM

To the Editor of The Veterinary Record

Sir,—The proceedings of a meeting of the Society of Veterinary Practitioners, held at Leeds on February 25th, 1936 (*Veterinary Record*, April 11th, page 473), contain a reference to ". . . a scheme of visiting all young stock instituted by a chief veterinary officer. . . ." If this statement is accurately reported, and if it refers to the *Voluntary* Scheme for the Formation of Tubercle-free Herds, presently being evolved in County Durham it is capable of misconstruction, and should be corrected.

A note on this voluntary scheme appeared in the *Veterinary Record* of March 21st, page 372, but it may be advantageous to restate briefly its salient features.

(1) Draft proposals for the formation of tubercle-free herds, contemplating the collaboration of all sections of the profession, were submitted to the North of England Division, N.V.M.A., by Mr. H. Birkett Allan, Chief Veterinary Officer for County Durham.

(2) The principle contained in these proposals was accepted by the division, and its Council was instructed to elaborate a detailed plan for further consideration. After approval by the division negotiations were opened with the County Branch of the National Farmers' Union, in order to establish a Joint Committee, representative of both sides, to foster the scheme and to control its working.

(3) The plan is entirely voluntary, both from the agricultural and veterinary aspects. Every veterinary surgeon practising in the county will be invited to co-operate, for it is contemplated that the whole of the tuberculin testing shall be done by the owner's *own* veterinary adviser. On the representation of Mr. Allan the local authority gave permission for its veterinary officers to co-operate in an *advisory* and *consultative* capacity.

(4) The first meeting of the Joint Committee was held on March 24th, and although good progress was made in the formulation of a mutually acceptable plan, certain details still remain for solution.

It would appear, therefore, that adverse criticism based on imperfect knowledge, on February 25th was premature. It is believed that the further development of the scheme will demonstrate the value of harmonious collaboration between the various sections of the profession in attempting a task of no small magnitude. Uninformed criticism at this early stage is not helpful, and is to be deplored.

Yours faithfully,
J. R. Rider.
(Chairman of the Joint Committee.)